

# Study plan

## Name of study plan: LED bak.prez.20/21 (skok do 3.r.)

Faculty/Institute/Others:

Department:

Branch of study guaranteed by the department: Welcome page

Garantor of the study branch:

Program of study: Technology in Transportation and Telecommunications

Type of study: Bachelor full-time

Required credits: 180

Elective courses credits: 0

Sum of credits in the plan: 180

Note on the plan:

Name of the block: Compulsory courses

Minimal number of credits of the block: 162

The role of the block: Z

Code of the group: 1.S.BP 20/21

Name of the group: 1.sem.bak.prez. (od) 20/21 (pro B3710)

Requirement credits in the group: In this group you have to gain 30 credits

Requirement courses in the group: In this group you have to complete 11 courses

Credits in the group: 30

Note on the group:

| Code   | Name of the course / Name of the group of courses<br>(in case of groups of courses the list of codes of their members)<br>Tutors, authors and guarantors (gar.)               | Completion | Credits | Scope     | Semester | Role |
|--------|---|------------|---------|-----------|----------|------|
| 11CAL1 | <b>Calculus 1</b><br>Olga Vraštilová, Magdalena Hykšová, Ondřej Navrátil, Tomáš Tasák, Bohumil Ková   | Z,ZK       | 7       | 2P+4C+2B  | Z        | Z    |
| 11LA   | <b>Linear Algebra</b><br>Lucie Kárná, Martina Bevářová, Pavel Provinský   | Z,ZK       | 3       | 2P+1C+10B | Z        | Z    |
| 12ZYDI | <b>Introduction to Transportation Engineering</b><br>Zuzana Arská, Vojtěch Novotný, Dagmar Kořáková   | Z,ZK       | 2       | 1P+1C     | Z        | Z    |
| 18MTY  | <b>Materials Science and Engineering</b><br>Jitka Ezníková, Michaela Neuhäuserová, Radim Dvořák, Václav Rada, Jan Falta, Jaroslav Valach                                      | Z,ZK       | 3       | 2P+1C+10B | Z        | Z    |
| 11GIE  | <b>Geometry</b><br>Pavel Provinský, Šárka Voráčová, Oldřich Hykš  | KZ         | 3       | 2P+2C+12B | Z        | Z    |
| 14ASD  | <b>Algorithm and Data Structures</b><br>Jana Kalíková, Jan Král, Tomáš Brandejský, Petr Hnyk, Michal Jeábek, Marek Kalík, Zdeněk Lokaj, Kirill Smirnov, Vít Fábera            | KZ         | 3       | 0P+2C+8B  | Z        | Z    |
| 14KSP  | <b>Constructing with Computer Aid</b><br>Jiří Brož, Jiří Brož, Martin Brumovský, Vladimír Douda, Radek Kratochvíl, Michal Mlada, Lukáš Svoboda, Martin Šrotý, Jan Vogl, ..... | KZ         | 2       | 0P+2C+8B  | Z        | Z    |
| 18TED  | <b>Technical Documentation</b><br>Jitka Ezníková, Vít Malinovský  | KZ         | 2       | 1P+1C+8B  | Z        | Z    |
| 15DPLG | <b>Transportation Psychology</b><br>Eva Režlerová, Jan Feit, Jana Štikarová   | Z          | 2       | 2P+0C+6B  | Z        | Z    |
| 16UDOP | <b>Introduction into Vehicles</b><br>Zuzana Radová, Josef Mík, Petr Bouchner  | Z          | 2       | 2P+0C+8B  | Z        | Z    |
| TV-1   | <b>Physical Education</b>   | Z          | 1       |           | Z        | Z    |

### Characteristics of the courses of this group of Study Plan: Code=1.S.BP 20/21 Name=1.sem.bak.prez. (od) 20/21 (pro B3710)

|        |  |      |   |   |
|--------|--|------|---|---|
| 11CAL1 | Calculus 1                                 | Z,ZK | 7 | Sequence of real numbers and its limit. Basic properties of mappings. Function of one real variable, its limit and derivative. Geometric properties of n-dimensional Eukclidean space and Cartesian coordinate system. Geometric meaning of the differential of functions several real variables, differential calculus of functions of several real variables. |
| 11LA   | Linear Algebra                             | Z,ZK | 3 | Vector spaces (linear combinations, linear independence, dimension, basis, coordinates). Matrices and operations. Systems of linear equations and their solvability. Determinants and their applications. Scalar product. Similarity of matrices (eigenvalues and eigenvectors). Quadratic forms and their classification.                                      |
| 12ZYDI | Introduction to Transportation Engineering | Z,ZK | 2 | Role of transportation in land-use planning. Basic terms in transportation engineering. Traffic survey and traffic prognosis. Introduction to topic of roads, public mass transport. Negative impacts of transportation to environment and safety.  |

|   |                                   |      |   |
|---|-----------------------------------|------|---|
| 18MTY   | Materials Science and Engineering | Z,ZK | 3 |
| Basic course of materials science and engineering explains mechanical properties of structural materials based on their bonding forces and microstructure. However the main attention is paid to metals as the most important engineering materials, also other major classes of materials are presented, namely ceramics, polymers and composites. Attention is also paid to degradation processes in materials, to defectoscopy and to main mechanical tests. |                                   |      |   |
| 11GIE   | Geometry                          | KZ   | 3 |
| Differential geometry of curves - parameterization, the arc of the curve, torsion and curvature, Frenet's trihedron. Kinematics - a curve as a trajectory of the motion, the velocity, and acceleration of a particle moving on a curved path.  |                                   |      |   |
| 14ASD   | Algorithm and Data Structures     | KZ   | 3 |
| Students will be familiarized with selected basic and derived data structures, algorithms, their properties and their design procedure. Students will analyze problems, propose theoretical solutions to the set task and the resulting algorithm write by means of flowcharts, practice in reading algorithms recorded by means of the flowchart and use the basics of Boolean algebra with forming the conditions for the algorithms.                         |                                   |      |   |
| 14KSP   | Constructing with Computer Aid    | KZ   | 2 |
| "CAD systems" term determination. CAD role in projecting system model. Existing CAD systems on Czech market. Project creation, basic common work rules in graphic applications and CA systems. Co-ordinated systems, CAD environment skill (basics of constructing, dimensioning, modifications, user interfaces, projecting possibilities, AutoCAD environment profiles, drawings with raster foundations).  |                                   |      |   |
| 18TED   | Technical Documentation           | KZ   | 2 |
| Technical standards, international standardization, technical drawings, representation of technical objects, technical diagrams and charts, dimensional and geometrical accuracy, arrangement of drawing sheets.  |                                   |      |   |
| 15DPLG  | Transportation Psychology         | Z    | 2 |
| Subject of psychology and its basic concepts. Information intake, decision-making and behaviour. Performance. Engineering psychology and vehicle construction. Psychological aspects of travel route and traffic conditions, accidents and traffic incidents. Selection and training of the staff. Work and leisure. Age as a factor in transport operation.  |                                   |      |   |
| 16UDOP  | Introduction into Vehicles        | Z    | 2 |
| Vehicles and transportation systems. Functionality and setup. Movement and drive principles. Engines and their characteristics. Rail, road, air and water transport. Alternative means of transport. Lifting equipment and conveyors. Legislation.  |                                   |      |   |
| TV-1  | Physical Education                | Z    | 1 |

Code of the group: 2.S.BP 20/21

Name of the group: 2.sem.bak.prez. (od) 20/21 (pro B3710)

Requirement credits in the group: In this group you have to gain 30 credits

Requirement courses in the group: In this group you have to complete 9 courses

Credits in the group: 30

Note on the group:

| Code   | Name of the course / Name of the group of courses<br>(in case of groups of courses the list of codes of their members)<br>Tutors, authors and guarantors (gar.)   | Completion | Credits | Scope     | Semester | Role |
|--------|---|------------|---------|-----------|----------|------|
| 11CAL2 | <b>Calculus 2</b><br>Olga Vraštilová, Magdalena Hykšová, Ondřej Navrátil, Tomáš Tasák, Oldřich Hykš <b>Magdalena Hykšová</b> Ondřej Navrátil (Gar.)               | Z,ZK       | 5       | 2P+3C+20B | L        | Z    |
| 11STAT | <b>Statistics</b><br>Pavel Provinský, Ivan Nagy, Pavla Pecherková, Evžen Uglíckich, Raissa Likhonina <b>Ivan Nagy</b> Ivan Nagy (Gar.)                            | Z,ZK       | 4       | 2P+2C+12B | L        | Z    |
| 12ZTS  | <b>Railway Lines and Stations</b><br>Lukáš Týfa, Martin Jacura, Petr Satra, Tomáš Javořík, Ondřej Trešl   | Z,ZK       | 4       | 2P+2C+10B | L        | Z    |
| 18SAT  | <b>Structural Analysis</b><br>Jitka Ezníková, Radim Dvořák, Václav Rada, Daniel Kytý, Ján Kopačka, Jan Vyšňák, Tomáš Doktor, Jan Šleicher                         | Z,ZK       | 4       | 2P+2C+14B | L        | Z    |
| 20SYSA | <b>Systems Analysis</b><br>Zuzana Bláhová, Jiří Růžka, Petr Bureš   | Z,ZK       | 5       | 2P+2C+14B | L        | Z    |
| 14PRG  | <b>Programming</b><br>Jana Kalíková, Jan Král, Michal Jeábek, Lukáš Svoboda, Alena Plašilová, Jan Procházka <b>Jana Kalíková</b> (Gar.)                           | KZ         | 2       | 0P+2C+8B  | L        | Z    |
| 17TEDL | <b>Transport Technology and Logistics</b><br>Vít Janoš, Michal Drábek, Zdeněk Michl, Milan Kříž, Jiří Pospíšil  | KZ         | 3       | 2P+1C     | L        | Z    |
| 21ZALD | <b>Basics of Air Transport</b><br>Jakub Hospodka, Peter Olexa, Tereza Topková, Kateřina Machulová, P. Ipánová, Sébastien Lán, Jakub Steiner <b>Jakub Hospodka</b> | KZ         | 2       | 0P+2C+8B  | L        | Z    |
| TV-2   | <b>Physical Education</b>   | Z          | 1       |           | L        | Z    |

Characteristics of the courses of this group of Study Plan: Code=2.S.BP 20/21 Name=2.sem.bak.prez. (od) 20/21 (pro B3710)

|   |                            |      |   |
|---|----------------------------|------|---|
| 11CAL2  | Calculus 2                 | Z,ZK | 5 |
| Antiderivative, Newtonian integral, Riemannian integral of the function of one variable, improper Riemannian integral, Riemannian integral in $R^n$ . Parametric description of regular $k$ -dimensional surfaces in $R^n$ , Riemannian integral over regular surfaces. Line and surface integrals of the second type, Stokes theorems, ordinary differential equations of the first order, linear differential equations with constant coefficients and its systems. |                            |      |   |
| 11STAT  | Statistics                 | Z,ZK | 4 |
| Definition of probability, random variable and its description, known distributions, random vector, function of random variable. Methods of point estimation. Testing of statistical hypothesis. Regression and correlation, linear regression, correlation coefficient, coefficient of determination, the general linear model, statistical inference in linear regression, analysis of variance, multiple regression, the use of matrices in regression.            |                            |      |   |
| 12ZTS   | Railway Lines and Stations | Z,ZK | 4 |
| Rail transport. Railway track geometry parameters. Route layout of railway lines. Railway line construction - railway substructure and superstructure. Spatial layout of railway lines. Railway control systems in relation to infrastructure. Operating and carriage points. Railway lines net and category. Traction in rail transport.   |                            |      |   |

|  |                                    |      |   |
|--|------------------------------------|------|---|
| 18SAT  | Structural Analysis                | Z,ZK | 4 |
| General system of forces in plane and space. Calculation of reactions of bodies and structures. Assessment of internal forces on statically determinate beams and simple girders. Principle of virtual work. Kinematic method for calculation of reactions of statically determinate systems. Determination of axial forces in truss constructions. Cross-sectional characteristics of planar shapes. Fiber polygons and chains.                 |                                    |      |   |
| 20SYSA   | Systems Analysis                   | Z,ZK | 5 |
| Introduction to system sciences, system viewpoint, terminology, typical system analysis tasks, system identification, system interface and interface tasks, processes, system behaviour and its analysis, strong functions and processes, genetic code, system identity, system architecture. Tools for system analysis - Petri nets, decision tables, algorithms for structural tasks. Soft and hard systems, methods for soft system analysis. |                                    |      |   |
| 14PRG  | Programming                        | KZ   | 2 |
| Algorithm development, methods of structured programming, high-level programming languages, basics of C programming languages (types, variables, conditions, cycles, arrays, functions), programming techniques, complexity.   |                                    |      |   |
| 17TEDL   | Transport Technology and Logistics | KZ   | 3 |
| Basic terms in transport technology and logistics, particular steps of transport planning, line planning, timetabling, planning in passenger and freight transport, organisation of traffic in each transport modus, technologic factors of the side of operator and client, organisation of city transport, logistic technologies and their application using various transport modus.  |                                    |      |   |
| 21ZALD   | Basics of Air Transport            | KZ   | 2 |
| History, definitions, terminology, basic rules. VFR/IFR. Basics of aerodynamics. Propulsion of aircraft. Aircraft design. Basics of navigation, radio navigation. Weight, balance, performance. Flight planning, optimization of speed and heights, minimum fuel. Limitations of operation, maintenance, service life of aircraft. Traffic management, ground handling, security. Air crew. Airlines and economics. Space technologies.          |                                    |      |   |
| TV-2   | Physical Education                 | Z    | 1 |

Code of the group: 3.S.BP 20/21

Name of the group: 3.sem.bak.prez. (od) 20/21 (pro B3710)

Requirement credits in the group: In this group you have to gain 30 credits

Requirement courses in the group: In this group you have to complete 8 courses

Credits in the group: 30

Note on the group:

| Code   | Name of the course / Name of the group of courses<br>(in case of groups of courses the list of codes of their members)<br>Tutors, authors and guarantors (gar.)                                       | Completion | Credits | Scope     | Semester | Role |
|--------|---|------------|---------|-----------|----------|------|
| 11FYZ  | <b>Physics</b><br>Zuzana Malá, Tomáš Vít, Antonio Cammarata, Kosta Simonovic, Marek Honc  | Z,ZK       | 5       | 2P+2C+18B | Z        | z    |
| 12MDE  | <b>Transport Models and Transport Excesses</b><br>Milan Dont, Josef Kocourek  | Z,ZK       | 3       | 2P+1C+8B  | Z        | z    |
| 17TGA  | <b>Graph Theory and its Applications in Transport</b><br>Alena Rybíková, Denisa Mocková, Dušan Teichmann  | Z,ZK       | 4       | 2P+2C+12B | Z        | z    |
| 18PZP  | <b>Elasticity and Strength</b><br>Jitka Štejnčíková, Daniel Kytý, Ján Kopačka, Jan Vyšňák, Tomáš Doktor, Jan Šleichrt, Petr Zlámal, Petr Koudelka, Radek Kolman, .....                                | Z,ZK       | 3       | 2P+1C+10B | Z        | z    |
| 20UITS | <b>Introduction to Intelligent Transport Systems</b><br>Martin Šrotý, Jiří Růžička, Patrik Horažovský, Kristýna Navrátilová, Pavel Hluska, Martin Langr, Tomáš Zelinka, Vladimír Faltus, Pavel Hrušeš | Z,ZK       | 7       | 3P+2C+20B | Z        | z    |
| 12PPOK | <b>Designing Roads, Highways and Motorways</b><br>Petr Šatra, Jiří Arský, Jan Gallia, Tomáš Padělek, Petr Kumpošt   | KZ         | 3       | 1P+2C+10B | Z        | z    |
| 14DATS | <b>Database Systems</b><br>Jana Kaliková, Jan Král, Alena Plašilová, Jan Procházka  | KZ         | 2       | 1P+1C+10B | Z        | z    |
| 15JZ1A | <b>Foreign Language - English 1</b><br>Eva Režlerová, Jan Feit, Peter Moppuss, Dana Boušová, Jitka Hejmanová, Lenka Monková, Markéta Olehlová, Marie Michlová, Markéta Vojanová, .....                | Z          | 3       | 0P+4C+10B |          | z    |

Characteristics of the courses of this group of Study Plan: Code=3.S.BP 20/21 Name=3.sem.bak.prez. (od) 20/21 (pro B3710)

|   |  |      |   |
|---|--|------|---|
| 11FYZ   | Physics  | Z,ZK | 5 |
| Kinematics, particle dynamics, dynamics of particle systems and rigid body. Continuum mechanics, thermodynamics.  |  |      |   |
| 12MDE   | Transport Models and Transport Excesses        | Z,ZK | 3 |
| Parameters of the traffic flow and methods for their measurement. Models of the traffic flow, communications load, line and urban systems. Theory of queues, shock waves. Quality of transport and its assessment. Statistical characteristics of transport. Transport excesses, their analysis, the causes, identify and minimize the consequences. Improving of transport safety and fluency.       |  |      |   |
| 17TGA   | Graph Theory and its Applications in Transport | Z,ZK | 4 |
| Basic terms of graph theory, paths in graphs, flows in networks, location problems, design problems on graphs, optimum routing, use of graphs in other scientific disciplines.  |  |      |   |
| 18PZP   | Elasticity and Strength                        | Z,ZK | 3 |
| Tension and compression. Bending of beam. Shear stress during bending of beam. Design and analysis of cross section of beam. Design of riveted, bolted and welded joint of structure. Analysis of deflection curve of beam. Torsion of circle cross section. Combined loading. Stability of compressed bar and buckling. Beam on elastic foundation. Strength analysis.                               |  |      |   |
| 20UITS  | Introduction to Intelligent Transport Systems  | Z,ZK | 7 |
| Terminology and legislative framework telematics systems and their architecture. Telematics systems in practice and their operation. Fundamentals of information and telecommunication systems for ITS. Principles and technical support measurement of traffic data, localization and navigation. Practical work with traffic data. Real examples of possible applications of the principles of ITS. |  |      |   |
| 12PPOK  | Designing Roads, Highways and Motorways        | KZ   | 3 |
| Definition, types, ownership, maintenance, management and categorization of roads and highways. Curve and transition curve. Sinuosity and standard speed. Route in rural areas. Range of vision for stopping and overtaking. Road body - shapes and proportions, bottom and superstructure. Drainage and components of roads. Safety device. Crossings, junctions, intersections.                     |  |      |   |

|  |                              |    |   |
|--|------------------------------|----|---|
| 14DATS   | Database Systems             | KZ | 2 |
| Basic concepts of database systems, conceptual model, relational data model, the principles of normal forms, relational database design, security and integrity of data, database queries, relational algebra, SQL language, client / server, multilayer architectures, distributed database systems. Access to data via the WWW.          |                              |    |   |
| 15JZ1A   | Foreign Language - English 1 | Z  | 3 |
| Grammatical structures and style. Selection of conversation topics relating to transportation sciences. Extending vocabulary, developing perceptive and communicative skills. Elementary stylistics forms. Oral and written presentation of original research. Academic text principles and reading comprehension. Principles of rhetoric. |                              |    |   |

Code of the group: 4.S.BLED 19/20

Name of the group: 4.sem.LED bak.prez. (od) 19/20 (pro B3710)

Requirement credits in the group: In this group you have to gain 26 credits

Requirement courses in the group: In this group you have to complete 8 courses

Credits in the group: 26

Note on the group:

| Code   | Name of the course / Name of the group of courses<br>(in case of groups of courses the list of codes of their members)<br><i>Tutors, authors and guarantors (gar.)</i>                | Completion | Credits | Scope     | Semester | Role |
|--------|---|------------|---------|-----------|----------|------|
| 11MSP  | <b>Modeling of Systems and Processes</b><br><i>Bohumil Ková, Lucie Kárná, Marek Honc, Jan Píkryl Bohumil Ková (Gar.)</i>  | Z,ZK       | 4       | 2P+2C+12B | L        | Z    |
| 21LTN  | <b>Air Navigation</b><br><i>Ladislav Keller, Radoslav Zozuák, Jakub Kraus <b>Jakub Kraus</b></i>  | Z,ZK       | 2       | 2P+1C+12B | L        | Z    |
| 21LTTE | <b>Aerodromes</b><br><i>Ladislav Capoušek, Petr Líka <b>Ladislav Capoušek</b></i>   | Z,ZK       | 4       | 2P+1C+12B | L        | Z    |
| 21ZYL1 | <b>Principles of Flight 1</b><br><i>P emysl Vávra, Michala Poštová, Liana Karapetjan, Vladimír Machula <b>Michala Poštová</b></i>   | Z,ZK       | 5       | 2P+2C+16B | L        | Z    |
| 21LL1  | <b>Aircraft 1</b><br><i>Ladislav Keller, Jakub Kraus, Karel Mündel, Max Chopart, Kateřina Stuchlíková, Stanislav Fiala <b>Jakub Kraus</b></i>   | KZ         | 3       | 2P+1C+10B | L        | Z    |
| 21MRG  | <b>Meteorology</b><br><i>Iveta Kameníková <b>Iveta Kameníková</b></i>   | KZ         | 3       | 1P+1C+10B | L        | Z    |
| 21ULCT | <b>Aircraft Maintenance</b><br><i>Kateřina Stuchlíková, Tomáš Parýzek <b>Tomáš Parýzek</b></i>  | Z          | 2       | 2P+0C+8B  | L        | Z    |
| 15JZ2A | <b>Foreign Language - English 2</b><br><i>Eva Režlerová, Jan Feit, Peter Morpuss, Jitka He manová, Lenka Monková, Markéta Olehlová, Marie Michlová, Markéta Vojanová, Marek Tomek</i> | Z,ZK       | 3       | 0P+4C+10B |          | Z    |

**Characteristics of the courses of this group of Study Plan: Code=4.S.BLED 19/20 Name=4.sem.LED bak.prez. (od) 19/20 (pro B3710)**

|   |                                   |      |   |
|---|-----------------------------------|------|---|
| 11MSP   | Modeling of Systems and Processes | Z,ZK | 4 |
| Mathematical methods and algorithms as a basis for system analysis. Methods for modelling and evaluating the systems in continuous and discrete time domain. Laplace transform, z-transform, and the recursive algorithms in solution of differential and difference equations, as an instrument for system description. Practical use of technical computing environment (MATLAB).   |                                   |      |   |
| 21LTN   | Air Navigation                    | Z,ZK | 2 |
| Earth - its shape, parameters and properties. Aeronautical charts and their use. Measuring time. Dead reckoning. Radionavigation aids. Global navigation satellite systems. Air traffic services routes and their design.   |                                   |      |   |
| 21LTTE  | Aerodromes                        | Z,ZK | 4 |
| Aerodrome reference point and temperature, TORA, TODA, ASDA, LDA. Taxiway and apron. Clearway. Stopway. Obstacle limitation surfaces. Runway marking. Runway zone lights. Environmental conditions. Public traffic.   |                                   |      |   |
| 21ZYL1  | Principles of Flight 1            | Z,ZK | 5 |
| Aerodynamic drag, relation between drag and speed, streamline, boundary layer, formula of continuity, formula of Bernoulli, lift and drag, air flow and pressures around wing, angle of attack, reactions of wing in air flow, lift and drag of a wing and an aircraft, coefficient of lift and drag, critical angle of attack, wing with final span, induced drag, interference, devices for lift and drag increase.                                       |                                   |      |   |
| 21LL1   | Aircraft 1                        | KZ   | 3 |
| Aircraft structural and conceptual design types - definitions and basic knowledge of the problem. Development of requirements, aircraft definitions and categorisation. Aircraft loadings. Systems of primary and secondary airframe structure. Airframe and propulsion unit. Lectures are devoted to aeroplane topics.   |                                   |      |   |
| 21MRG   | Meteorology                       | KZ   | 3 |
| Structure of atmosphere. Vertical stratification. Pressures QNH, QFE, QFF, QNE. Instability. Atmospheric fronts. Atmospheric precipitation - origin and kinds. Turbulence. Powers causing wind. Cyclone and anticyclone. Gradient and geostrophical wind. Visibilities in air transport. Dangerous meteorological phenomena. Meteorological maps. Climatology. Circulation. Intertropical front. Meteorological informations.                               |                                   |      |   |
| 21ULCT  | Aircraft Maintenance              | Z    | 2 |
| Aircraft operations and technical operations. Maintenance and work processes. Defects search methods, status check diagnostic tools. Selection and qualification of aviation personnel. Basic documentation for maintenance. Optimization of time maintenance intervals. Regulation no. 1321/2014 Part 145. Human factors of aircraft maintenance. Regulation of director EASA for aircraft maintenance. Seminars will be focused on practical application. |                                   |      |   |
| 15JZ2A  | Foreign Language - English 2      | Z,ZK | 3 |
| Grammatical structures and style. Selection of conversation topics relating to transportation sciences. Extending vocabulary, developing perceptive and communicative skills. Elementary stylistics forms. Oral and written presentation of original research. Academic text principles and reading comprehension. Principles of rhetoric.  |                                   |      |   |

Code of the group: 5.S.BLED 19/20

Name of the group: 5.sem.LED bak.prez. (od) 19/20 (pro B3710)

Requirement credits in the group: In this group you have to gain 23 credits

Requirement courses in the group: In this group you have to complete 7 courses

Credits in the group: 23

Note on the group:

| Code   | Name of the course / Name of the group of courses<br>(in case of groups of courses the list of codes of their members)<br>Tutors, authors and guarantors (gar.) | Completion | Credits | Scope | Semester | Role |
|--------|---|------------|---------|-------|----------|------|
| 21LCM  | <b>Aircraft Engines</b><br>Jakub Kraus, Kateřina Stuchlíková, Tomáš Parýzek, Denisa Svobodová, Ondřej Vítovec, Daniel Hanus                                     | Z,ZK       | 3       | 2P+1C | Z        | Z    |
| 21LGP  | <b>Legislation and Operational Regulations</b><br>Radoslav Zozuňák, Jakub Kraus, Adéla Zmeškalová   | Z,ZK       | 5       | 2P+2C | Z        | Z    |
| 21LTA2 | <b>Aircraft 2</b><br>Ladislav Keller, Jakub Kraus, Max Chopart, Denisa Svobodová, Oldřich Štumbauer   | Z,ZK       | 2       | 2P+1C | Z        | Z    |
| 21ZT   | <b>ATM Systems</b><br>Jakub Steiner, Jakub Kraus, Terézia Pilmannová, Petr Lukeš, Stanislav Pleninger   | ZK         | 2       | 2P+0C | Z        | Z    |
| 21ZYL2 | <b>Principles of Flight 2</b><br>Jakub Kraus, Přemysl Vávra, Liana Karapetjan, Vladimír Machula, Martin Vecko, Václav Brož                                      | Z,ZK       | 5       | 2P+2C | Z        | Z    |
| 21LAG1 | <b>English for Aviation 1</b><br>Jakub Kraus, Max Chopart, Terézia Pilmannová, Andrej Lališ   | KZ         | 3       | 0P+2C | Z        | Z    |
| 21PDLE | <b>Airport Design and Operation</b><br>Jakub Kraus, Ladislav Capoušek, Petr Líka  | KZ         | 3       | 1P+1C | Z        | Z    |

Characteristics of the courses of this group of Study Plan: Code=5.S.BLED 19/20 Name=5.sem.LED bak.prez. (od) 19/20 (pro B3710)

|        |   |      |   |   |  |  |
|--------|---|------|---|---|--|--|
| 21LCM  | Aircraft Engines                        | Z,ZK | 3 | Aircraft piston engine, theoretical background, operational characteristics and construction schemes. Propellers, operational characteristics. Turbine engine, theoretical background, thermal cycles, construction schemes, operational characteristics. Turbojet and turbofan engines, basic construction modules, and their operational characteristics. Engine control.   |  |  |
| 21LGP  | Legislation and Operational Regulations | Z,ZK | 5 | Introduction into aviation regulations. The scope of international and national organizations in civil aviation. Analysis and interpretation of the ICAO Annexes 1-19, ICAO Docs. 4444, 7030, 8168. Introduction to the European Parliament and Council Regulation (EC), Commission Regulation (EU) and the Decisions of the Executive Director of EASA.  |  |  |
| 21LTA2 | Aircraft 2                              | Z,ZK | 2 | Manufacturers responsibility, responsibilities of operator and professional supervising. Legislation in area of airworthiness. International and national standards. Static solidity of aircraft structures. Aeroelasticity. Inherent and operational reliability of aircraft structure. Fatigue strength. Aircraft structure lifetime presumption.   |  |  |
| 21ZT   | ATM Systems                             | ZK   | 2 | The course introduces classical and modern facilities, systems and technologies designated for ATS. Student obtains knowledge of technical principles and solutions as far as communication, navigation and surveillance aviation systems are concerned.  |  |  |
| 21ZYL2 | Principles of Flight 2                  | Z,ZK | 5 | Ways of producing thrust, propeller, jet propulsion, thrust and momentum, propulsion efficiency, aerodynamics of fixed and variable pitch propeller, propeller operation modes, propeller airstream effect, gyroscopic effect, balance of forces in horizontal flight, glide and landing, performances, take off a climb, acceleration, positive load, manoeuvres, stability and controllability, transonic speeds. |  |  |
| 21LAG1 | English for Aviation 1                  | KZ   | 3 | Familiarity with the terminology used in civil aviation in the general context and emphasizing the ability to receive information only in English.  |  |  |
| 21PDLE | Airport Design and Operation            | KZ   | 3 | Methods for the new airports design. Existing airports development. A closer look at the development of the airports operational areas. Certification of the operating areas and procedures by ICAO Airports Manual. Development planning and project preparation, regulatory basis.  |  |  |

Code of the group: 6.S.BLED 19/20

Name of the group: 6.sem.LED bak.prez. (od) 19/20 (pro B3710)

Requirement credits in the group: In this group you have to gain 23 credits

Requirement courses in the group: In this group you have to complete 7 courses

Credits in the group: 23

Note on the group:

| Code   | Name of the course / Name of the group of courses<br>(in case of groups of courses the list of codes of their members)<br>Tutors, authors and guarantors (gar.) | Completion | Credits | Scope     | Semester | Role |
|--------|---|------------|---------|-----------|----------|------|
| 21ELED | <b>Air Transport Economy</b><br>Peter Vittek, Eva Endrizalová <b>Peter Vittek</b>   | Z,ZK       | 4       | 2P+2C+14B | L        | Z    |
| 21LIVO | <b>Human Performance and Limitations</b><br>Lenka Hanáková, Vladimír Socha, Boris Onišenko <b>Boris Onišenko</b>  | Z,ZK       | 5       | 2P+2C+14B | L        | Z    |
| 21OBP  | <b>Flight Planning and Performance</b><br>Peter Vittek, Eva Endrizalová <b>Peter Vittek</b>   | Z,ZK       | 3       | 2P+1C+12B | L        | Z    |
| 21PAP  | <b>Flight Planning and Performance</b><br>Denisa Svobodová, Ota Hajzler, Marek Šudoma, Roman Matyáš <b>Roman Matyáš</b>   | Z,ZK       | 4       | 2P+2C+14B | L        | Z    |
| 21LAG2 | <b>Aircraft Instruments</b><br>Terézia Pilmannová, Andrej Lališ, Tereza Dvořáková <b>Terézia Pilmannová</b>   | KZ         | 3       | 0P+2C+10B | L        | Z    |
| 21PJE  | <b>Aircraft Instruments</b><br>Pavel Hovorka <b>Pavel Hovorka</b>   | KZ         | 2       | 2P+0C+8B  | L        | Z    |

|        |  |   |   |          |   |   |
|--------|--|---|---|----------|---|---|
| 21RILP | <b>Air Traffic Control</b><br><i>Terézia Pilmannová, Miloš Strouhal Miloš Strouhal</i> | Z | 2 | 0P+2C+8B | L | Z |
|--------|--|---|---|----------|---|---|

**Characteristics of the courses of this group of Study Plan: Code=6.S.BLED 19/20 Name=6.sem.LED bak.prez. (od) 19/20 (pro B3710)**

|   |                                   |      |   |
|---|-----------------------------------|------|---|
| 21ELED  | Air Transport Economy             | Z,ZK | 4 |
| The economics of air transport is a key subject for understanding market relations in air transport. The introduction is devoted to understanding the basic economic principles. This is followed by a practical section that economic linkages in the domain of airlines.  |                                   |      |   |
| 21LIVO  | Human Performance and Limitations | Z,ZK | 5 |
| Human performance & limitations, aptibility & competence, accident statistics, flight safety, basics of flight physiology, man & environment, breathing & circulation, sensory system, health & hygiene, health preservation, intoxication, incapacitation, basics of flight psychology, human information processing, memory & learning, theory & model of human error, body rhythms & sleep, stress, fatigue, working methods.    |                                   |      |   |
| 21OBP   |                                   | Z,ZK | 3 |
| Aviation business and transport operations is a core subject for understanding operational relationships in air transport. It focuses on the process and functional arrangements as well as the economic aspects and infrastructure of air transport.   |                                   |      |   |
| 21PAP   | Flight Planning and Performance   | Z,ZK | 4 |
| Mass and balance. Load of aircraft. Determination of centre of gravity - loadsheet, trimsheet. Aircraft weighing. Overloading of aircraft. Basic characteristic speeds. Runway characteristics. Take off and landing performance. Drift down. ETOPS. MEL. Flight planning and monitoring. Routing. FL and speeds selection. Charts. ICAO ATC FPL. Aerodrom operation minimums. Fuel plan. Operational flight plan.                  |                                   |      |   |
| 21LAG2  |                                   | KZ   | 3 |
| 21PJE   | Aircraft Instruments              | KZ   | 2 |
| Overview of aircraft instrumentation and its principles and construction, aircraft electrical systems, engine measuring and monitoring systems, air data computer, icing monitoring systems, gyroscopic indicators, inertial and radio navigation means, communication means, data recorders, complex flight and navigation data processing systems.  |                                   |      |   |
| 21RILP  | Air Traffic Control               | Z    | 2 |
| Air traffic services and their distribution. Organization of air traffic, flow and capacity management. Airspace management. System support for aircraft flying through space. Flight plan, the form, content. Separation of aircraft. Reports of air traffic services, the form, content. Harmonization and integration of ATC. CFMU and its subsystems. Flexible use of airspace - FUA. RVSM, RNP. New trends in the area of ATC. |                                   |      |   |

Name of the block: Semestrální projekt

Minimal number of credits of the block: 6

The role of the block: ZP

Code of the group: XB 4,5,6 13/14

Name of the group: Projekty bak. 4.5.6.sem. (od)13/14 - pro B3710

Requirement credits in the group: In this group you have to gain 6 credits

Requirement courses in the group: In this group you have to complete 3 courses

Credits in the group: 6

Note on the group:

| Code  | Name of the course / Name of the group of courses<br>(in case of groups of courses the list of codes of their members)<br><i>Tutors, authors and guarantors (gar.)</i>        | Completion | Credits | Scope | Semester | Role |
|-------|---|------------|---------|-------|----------|------|
| 11X31 | <b>Project 1</b><br><i>Bohumil Ková, Ivan Nagy, Evžen Uglíckich, Jan Píkryl Ondřej Píbyl Jan Píkryl (Gar.)</i>  | Z          | 2       | 0P+1C | L        | ZP   |
| 12X31 | <b>Project 1</b><br><i>Zuzana Arská, Vojtěch Novotný, Dagmar Koárková, Jan Kruntorád, Andreas Papadopoulos, Lukáš Týfa, Martin Jacura, Tomáš Javořík, Ondřej Trešl, .....</i> | Z          | 2       | 0P+1C | L        | ZP   |
| 14X31 | <b>Project 1</b><br><i>Jana Kalíková, Vít Fábbera</i>   | Z          | 2       | 0P+1C | L        | ZP   |
| 15X31 | <b>Project 1</b>  | Z          | 2       | 0P+1C | L        | ZP   |
| 16X31 | <b>Project 1</b><br><i>Josef Mík, Pěmysl Toman, Dmitry Rozhdestvenskij</i>  | Z          | 2       | 0P+1C | L        | ZP   |
| 17X31 | <b>Project 1</b><br><i>Vít Janoš, Michal Drábek, Zdeněk Michl, Milan Kříž, Jiří Pospíšil, Alena Rybíková, Denisa Mocková, Dušan Teichmann, Daniel Pilát, .....</i>            | Z          | 2       | 0P+1C | L        | ZP   |
| 18X31 | <b>Project 1</b><br><i>Michaela Neuhäuserová, Jan Falta, Jaroslav Valach, Jan Šleichrt, Tomáš Fíla</i>  | Z          | 2       | 0P+1C | L        | ZP   |
| 20X31 | <b>Project 1</b><br><i>Jiří Růžka, Milan Sliacky</i>  | Z          | 2       | 0P+1C | L        | ZP   |
| 21X31 | <b>Project 1</b><br><i>Jakub Hospodka, Jakub Kraus, Stanislav Pleninger, Andrej Lališ, Peter Vittek, Lenka Hanáková, Vladimír Socha, Slobodan Stojić, Lukáš Popek</i>         | Z          | 2       | 0P+1C | L        | ZP   |
| 22X31 | <b>Project 1</b><br><i>Michal Frydryn, Karel Kocián, Luboš Nouzovský, Zdeněk Svátý</i>  | Z          | 2       | 0P+1C | L        | ZP   |
| 23X31 | <b>Project 1</b><br><i>Milena Macková</i>   | Z          | 2       | 0P+1C | L        | ZP   |
| 11X32 | <b>Project 2</b><br><i>Bohumil Ková, Ivan Nagy, Evžen Uglíckich, Jan Píkryl, Ondřej Píbyl Ondřej Píbyl Bohumil Ková (Gar.)</i>  | Z          | 2       | 0P+2C | Z        | ZP   |

|       |   |   |   |       |   |    |
|-------|---|---|---|-------|---|----|
| 12X32 | <b>Project 2</b><br>Zuzana arská, Vojtěch Novotný, Dagmar Koárková, Lukáš Týfa, Martin Jacura, Tomáš Javoík, Ondřej Třešl, Pavel Purkart, Josef Kocourek, .....                 | Z | 2 | 0P+2C | Z | ZP |
| 14X32 | <b>Project 2</b><br>Jana Kaliková, Marek Kalika, Vít Fábera, Martin Šrotý, Ota Hajzler  | Z | 2 | 0P+2C | Z | ZP |
| 15X32 | <b>Project 2</b>  | Z | 2 | 0P+2C | Z | ZP |
| 16X32 | <b>Project 2</b><br>Josef Mík, P emysl Toman  | Z | 2 | 0P+2C | Z | ZP |
| 17X32 | <b>Project 2</b><br>Vít Janoš, Michal Drábek, Zdeněk Michl, Milan Kříž, Jiří Pospíšil, Alena Rybíková, Denisa Mocková, Dušan Teichmann, Daniel Pilát, .....                     | Z | 2 | 0P+2C | Z | ZP |
| 18X32 | <b>Project 2</b><br>Jaroslav Valach, Daniel Kytý  | Z | 2 | 0P+2C | Z | ZP |
| 20X32 | <b>Project 2</b><br>Jiří Růžka, Martin Leso   | Z | 2 | 0P+2C | Z | ZP |
| 21X32 | <b>Project 2</b><br>Jakub Hospodka, Jakub Steiner, Iveta Kameníková, Terézia Pilmannová, Stanislav Pleninger, Andrej Lališ, Peter Vittek, Lenka Hanáková, Vladimír Socha, ..... | Z | 2 | 0P+2C | Z | ZP |
| 22X32 | <b>Project 2</b><br>Michal Frydrýn, Karel Kocián, Luboš Nouzovský, Zdeněk Svatý, Tomáš Miunek   | Z | 2 | 0P+2C | Z | ZP |
| 23X32 | <b>Project 2</b><br>Václav Jirovský, Milena Macková   | Z | 2 | 0P+2C | Z | ZP |
| 11X33 | <b>Project 3</b><br>Bohumil Kovář, Ivan Nagy, Evžen Uglickich, Jan Píkr, Ondřej Píbr, Jan Píkr (Gar.)   | Z | 2 | 0P+1C | L | ZP |
| 12X33 | <b>Project 3</b><br>Vojtěch Novotný, Dagmar Koárková, Jan Krontorád, Andreas Papadopoulos, Lukáš Týfa, Martin Jacura, Tomáš Javoík, Ondřej Třešl, Pavel Purkart, .....          | Z | 2 | 0P+1C | L | ZP |
| 14X33 | <b>Project 3</b><br>Jana Kaliková, Zdeněk Lokaj, Vít Fábera, Martin Šrotý, Tomáš Zelinka, Ota Hajzler   | Z | 2 | 0P+1C | L | ZP |
| 15X33 | <b>Project 3</b>  | Z | 2 | 0P+1C | L | ZP |
| 16X33 | <b>Project 3</b><br>Josef Mík, P emysl Toman  | Z | 2 | 0P+1C | L | ZP |
| 17X33 | <b>Project 3</b><br>Vít Janoš, Michal Drábek, Zdeněk Michl, Milan Kříž, Jiří Pospíšil, Alena Rybíková, Denisa Mocková, Dušan Teichmann, Daniel Pilát, .....                     | Z | 2 | 0P+1C | L | ZP |
| 18X33 | <b>Project 3</b><br>Michaela Neuhäuserová, Jan Falta, Jaroslav Valach, Jan Šleichrt, Tomáš Fila   | Z | 2 | 0P+1C | L | ZP |
| 20X33 | <b>Project 3</b><br>Jiří Růžka  | Z | 2 | 0P+1C | L | ZP |
| 21X33 | <b>Project 3</b><br>Jakub Hospodka, Jakub Kraus, Stanislav Pleninger, Andrej Lališ, Peter Vittek, Lenka Hanáková, Vladimír Socha, Slobodan Stojić, Lukáš Popek, .....           | Z | 2 | 0P+1C | L | ZP |
| 22X33 | <b>Project 3</b><br>Michal Frydrýn, Karel Kocián, Luboš Nouzovský, Zdeněk Svatý   | Z | 2 | 0P+1C | L | ZP |
| 23X33 | <b>Project 3</b>  | Z | 2 | 0P+1C | L | ZP |

**Characteristics of the courses of this group of Study Plan: Code=XB 4,5,6 13/14 Name=Projekty bak. 4.5.6.sem. (od)13/14 - pro B3710**

|       |           |   |   |
|-------|-----------|---|---|
| 11X31 | Project 1 | Z | 2 |
| 12X31 | Project 1 | Z | 2 |
| 14X31 | Project 1 | Z | 2 |
| 15X31 | Project 1 | Z | 2 |
| 16X31 | Project 1 | Z | 2 |
| 17X31 | Project 1 | Z | 2 |
| 18X31 | Project 1 | Z | 2 |
| 20X31 | Project 1 | Z | 2 |
| 21X31 | Project 1 | Z | 2 |
| 22X31 | Project 1 | Z | 2 |
| 23X31 | Project 1 | Z | 2 |
| 11X32 | Project 2 | Z | 2 |
| 12X32 | Project 2 | Z | 2 |
| 14X32 | Project 2 | Z | 2 |
| 15X32 | Project 2 | Z | 2 |
| 16X32 | Project 2 | Z | 2 |
| 17X32 | Project 2 | Z | 2 |
| 18X32 | Project 2 | Z | 2 |
| 20X32 | Project 2 | Z | 2 |
| 21X32 | Project 2 | Z | 2 |
| 22X32 | Project 2 | Z | 2 |
| 23X32 | Project 2 | Z | 2 |
| 11X33 | Project 3 | Z | 2 |

|       |           |   |   |
|-------|-----------|---|---|
| 12X33 | Project 3 | Z | 2 |
| 14X33 | Project 3 | Z | 2 |
| 15X33 | Project 3 | Z | 2 |
| 16X33 | Project 3 | Z | 2 |
| 17X33 | Project 3 | Z | 2 |
| 18X33 | Project 3 | Z | 2 |
| 20X33 | Project 3 | Z | 2 |
| 21X33 | Project 3 | Z | 2 |
| 22X33 | Project 3 | Z | 2 |
| 23X33 | Project 3 | Z | 2 |

Name of the block: Compulsory elective courses

Minimal number of credits of the block: 6

The role of the block: PV

Code of the group: Y1-BLED 20/21

Name of the group: PVP bak.prez.LED 20/21

Requirement credits in the group: In this group you have to gain 6 credits

Requirement courses in the group: In this group you have to complete 3 courses

Credits in the group: 6

Note on the group:

| Code   | Name of the course / Name of the group of courses<br>(in case of groups of courses the list of codes of their members)<br><i>Tutors, authors and guarantors (gar.)</i> | Completion | Credits | Scope | Semester | Role |
|--------|--|------------|---------|-------|----------|------|
| 21Y1AM | <b>Aeronautical Information Management (AIM)</b><br><i>Peter Olexa, Jakub Kraus, Radek Hoda</i>  | KZ         | 2       | 2P+0C | Z        | PV   |
| 20Y1AF | <b>Alternative Forms of Transportation Project Financing</b><br><i>Mária Jánešová Mária Jánešová (Gar.)</i>  | KZ         | 2       | 2P+0C | Z        | PV   |
| 18Y1AM | <b>Anatomy, Mobility and Safety of Man</b>   | KZ         | 2       | 2P+0C | Z        | PV   |
| 14Y1AV | <b>Animation and Visualization</b>   | KZ         | 2       | 2P+0C | L        | PV   |
| 20Y1AE | <b>Applied Electronics</b><br><i>Vít Fábera, Tomáš Musil Vít Fábera (Gar.)</i>   | KZ         | 2       | 2P+0C | Z        | PV   |
| 14Y1BE | <b>Barrierless Transport</b><br><i>Jan Král</i>  | KZ         | 2       | 2P+0C | L        | PV   |
| 21Y1BC | <b>Aviation safety and security</b><br><i>Andrej Lališ, Slobodan Stojić, Markéta Šedivá Kafková, Vladimír Plos Andrej Lališ</i>  | KZ         | 2       | 2P+0C | L        | PV   |
| 15Y1BO | <b>Work Safety and Health Protection in Transportation</b><br><i>Eva Rezlerová, Petr Musil</i>   | KZ         | 2       | 2P+0C | L        | PV   |
| 11Y1BK | <b>Error Detection Codes for Interlocking Systems</b><br><i>Lucie Kárná Lucie Kárná (Gar.)</i>   | KZ         | 2       | 2P+0C | Z        | PV   |
| 21Y1BS | <b>Unmanned aircraft systems 1</b><br><i>Jakub Kraus, Adam Kleczatský, Sárka Hulínská Jakub Kraus</i>  | KZ         | 2       | 2P+0C | L        | PV   |
| 14Y1BM | <b>Biometric Methods</b>   | KZ         | 2       | 2P+0C | Z        | PV   |
| 23Y1DZ | <b>Data and Their Processing for Engineering Fields Needs</b>  | KZ         | 2       | 2P+0C | Z        | PV   |
| 15Y1DZ | <b>History of Railway</b><br><i>Eva Rezlerová, Martin Jacura</i>   | KZ         | 2       | 2P+0C | L        | PV   |
| 12Y1DS | <b>Project Documentation in Practice</b>   | KZ         | 2       | 2P+0C | Z        | PV   |
| 17Y1EV | <b>Public Sector Economy</b>   | KZ         | 2       | 2P+0C | Z        | PV   |
| 20Y1EK | <b>Qualification in Electrical Engineering</b><br><i>Jindřich Sadil</i>  | KZ         | 2       | 2P+0C | L        | PV   |
| 16Y1EN | <b>Energy Requirements of Vehicles</b><br><i>Jarosláv Opava</i>  | KZ         | 2       | 2P+0C | L        | PV   |
| 20Y1EA | <b>Environmental Aspects of Transport</b>  | KZ         | 2       | 2P+0C | Z        | PV   |
| 15Y1EH | <b>European Integration within Historical Context</b><br><i>Eva Rezlerová, Jan Feit</i>  | KZ         | 2       | 2P+0C | Z        | PV   |
| 18Y1EM | <b>Experimental Methods in Mechanics</b><br><i>Daniel Kytý, Ján Kopa ka</i>  | KZ         | 2       | 2P+0C | Z        | PV   |
| 21Y1FN | <b>Factors Affecting the Rate of Accidents in Aviation</b>   | KZ         | 2       | 2+0   | Z        | PV   |
| 15Y1FD | <b>French Area Studies and Transportation</b><br><i>Eva Rezlerová, Irena Veselková</i>   | KZ         | 2       | 2P+0C | L        | PV   |
| 14Y1HW | <b>Computer Hardware</b>   | KZ         | 2       | 2P+0C | L        | PV   |
| 15Y1HL | <b>History of Civil Aviation</b><br><i>Eva Rezlerová, Jakub Kraus, Vladimír Plos</i>   | KZ         | 2       | 2P+0C | L        | PV   |



|        |   |    |   |       |   |    |
|--------|---|----|---|-------|---|----|
| 15Y1HD | <b>History of City Mass Transport</b><br><i>Eva Rezlerová, Jan Feit, Milan Dont</i>   | KZ | 2 | 2P+0C | Z | PV |
| 12Y1HD | <b>Traffic Noise</b><br><i>Libor Ládyš</i>  | KZ | 2 | 2P+0C | L | PV |
| 15Y1HE | <b>Work Hygiene and Ergonomics in Traffic</b><br><i>Eva Rezlerová, Jan Feit, Petr Musil</i>   | KZ | 2 | 2P+0C | Z | PV |
| 16Y1IS | <b>Interactive simulators and simulations</b>   | KZ | 2 | 2P+0C | L | PV |
| 12Y1KN | <b>Combined Transportation</b>  | KZ | 2 | 2P+0C | Z | PV |
| 20Y1KP | <b>Communication and presentation skills</b><br><i>Ji í R ži ka, Patrik Horaž ovský, Kristýna Navrátilová, Zuzana Purkrábková<br/>Ji í R ži ka (Gar.)</i> | KZ | 2 | 2P+0C | Z | PV |
| 23Y1KM | <b>Crisis Management</b>  | KZ | 2 | 2P+0C | Z | PV |
| 23Y1KO | <b>Quantum Physics and Optoelectronics</b>  | KZ | 2 | 2P+0C | L | PV |
| 17Y1LL | <b>Logistics of Passenger and Freight Air Transport</b><br><i>Petra Skolilová</i>   | KZ | 2 | 2P+0C | L | PV |
| 20Y1LN | <b>Location and Navigation</b><br><i>Petr Bureš</i>   | KZ | 2 | 2P+0C | L | PV |
| 21Y1MZ | <b>Managerial Ethics</b>  | KZ | 2 | 2+0   | Z | PV |
| 17Y1MD | <b>Marketing in Transportation</b><br><i>Petra Skolilová</i>  | KZ | 2 | 2P+0C | Z | PV |
| 11Y1MM | <b>Mathematical Models in Economy</b>   | KZ | 2 | 2P+0C | Z | PV |
| 18Y1MT | <b>Engineering Materials</b><br><i>Jaroslav Valach</i>  | KZ | 2 | 2P+0C | L | PV |
| 21Y1MP | <b>Matlab for project-oriented study</b><br><i>Lenka Hanáková, Vladimír Socha</i>   | KZ | 2 | 2P+0C | Z | PV |
| 14Y1MP | <b>Modeling Complex Assemblies and Models in Parametric Modeller</b>  | KZ | 2 | 2P+0C | Z | PV |
| 15Y1MK | <b>Modern History in Context: Every Day Life and Transport</b><br><i>Eva Rezlerová, Marie Michlová</i>  | KZ | 2 | 2P+0C | L | PV |
| 15Y1NE | <b>German in the Economy and Society</b><br><i>Eva Rezlerová, Jan Feit</i>  | KZ | 2 | 2P+0C | Z | PV |
| 23Y1OK | <b>Protection of Critical Objects and Infrastructures</b><br><i>Dan ok</i>  | KZ | 2 | 2P+0C | L | PV |
| 20Y1OI | <b>Fare Collection and Information Systems</b><br><i>Patrik Horaž ovský, Milan Sliacky</i>  | KZ | 2 | 2P+0C | L | PV |
| 14Y1OJ | <b>Object - oriented programming in JAVA</b>  | KZ | 2 | 2P+0C | L | PV |
| 14Y1OP | <b>Operating System</b>   | KZ | 2 | 2P+0C | Z | PV |
| 17Y1OF | <b>Personal Finance</b>   | KZ | 2 | 2P+0C | Z | PV |
| 20Y1OK | <b>Road Lighting</b><br><i>František Kekula, Llibor Kousal, Tomáš Tichý</i>   | KZ | 2 | 2P+0C | L | PV |
| 11Y1PV | <b>Parametrical and Multicriterial Programming</b><br><i>Olga Vraštilová Olga Vraštilová (Gar.)</i>   | KZ | 2 | 2P+0C | Z | PV |
| 17Y1PM | <b>Personnel Management</b>   | KZ | 2 | 2P+0C | L | PV |
| 12Y1PC | <b>Pedestrian and Cycling Transport</b><br><i>Denis Liutov</i>  | KZ | 2 | 2P+0C | L | PV |
| 14Y1PG | <b>Computer Graphics</b>  | KZ | 2 | 2P+0C | L | PV |
| 14Y1P2 | <b>Computer Aid of Transportation Projecting 2</b>  | KZ | 2 | 2P+0C | Z | PV |
| 18Y1PS | <b>Computer Simulations in Mechanics</b><br><i>Petr Zlámal</i>  | KZ | 2 | 2P+0C | L | PV |
| 14Y1PI | <b>Corporate Information System</b><br><i>Tomáš Brandejský Tomáš Brandejský (Gar.)</i>  | KZ | 2 | 2P+0C | Z | PV |
| 14Y1PZ | <b>Advanced Data Processing in Spreadsheets</b>   | KZ | 2 | 2P+0C | Z | PV |
| 12Y1PD | <b>Assessment of Transport Structures</b><br><i>Kristýna Neubergová</i>   | KZ | 2 | 2P+0C | Z | PV |
| 20Y1PK | <b>Product Quality Management Processes</b><br><i>Martin Leso Martin Leso (Gar.)</i>  | KZ | 2 | 2P+0C | Z | PV |
| 14Y1PJ | <b>C Programming Language</b><br><i>Vít Fábera Vít Fábera (Gar.)</i>  | KZ | 2 | 2P+0C | Z | PV |
| 12Y1C1 | <b>Designing Roads in Civil 3D I</b><br><i>Tomáš Honc</i>   | KZ | 2 | 2P+0C | L | PV |
| 12Y1C2 | <b>Designing Roads in Civil 3D II</b><br><i>Tomáš Honc</i>  | KZ | 2 | 2P+0C | Z | PV |
| 14Y1PA | <b>3D Modeling in AutoCAD</b>   | KZ | 2 | 2P+0C | Z | PV |
| 16Y1PV | <b>Operation, Construction and Maintenance of Vehicles</b>  | KZ | 2 | 2P+0C | L | PV |
| 21Y1PA | <b>Air Traffic Control Operating Procedures</b><br><i>Terézia Pilmannová</i>  | KZ | 2 | 2P+0C | Z | PV |
| 12Y1PU | <b>Organization Disposition of Railway Stations</b><br><i>Martin Jacura</i>   | KZ | 2 | 2P+0C | L | PV |
| 12Y1RU | <b>Railway Lines Reconstruction</b>   | KZ | 2 | 2P+0C | Z | PV |

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|--------|--|----|---|-------|---|----|
| 16Y1RE | <b>Control and Electronic Vehicle Systems</b><br><i>Josef Mík, P emysl Toman, Ji í First</i>               | KZ | 2 | 2P+0C | Z | PV |
| 21Y1RZ | <b>Human Resources Management</b>  | KZ | 2 | 2P+0C | L | PV |
| 17Y1ST | <b>Titan Simulation</b>  | KZ | 2 | 2P+0C | L | PV |
| 20Y1SC | <b>Sensors and Actuators</b><br><i>Pavel Hrubeš</i>  | KZ | 2 | 2P+0C | L | PV |
| 17Y1SL | <b>Sociology of Human Resources</b>  | KZ | 2 | 2P+0C | Z | PV |
| 11Y1SI | <b>Transportation Software Engineering</b><br><i>Martin P ni ka Martin P ni ka (Gar.)</i>                  | KZ | 2 | 2P+0C | Z | PV |
| 16Y1KS | <b>Quality and Reliability of Vehicles</b>   | KZ | 2 | 2P+0C | Z | PV |
| 12Y1SU | <b>Road Management and Maintenance</b>   | KZ | 2 | 2P+0C | L | PV |
| 17Y1SK | <b>Urban and Regional Rail Transport Systems</b><br><i>Ji í Pospíšil</i>                                   | KZ | 2 | 2P+0C | L | PV |
| 21Y1TH | <b>Aircraft Technical Handling</b><br><i>Peter Olexa, Jakub Kraus, Slobodan Stoji</i>                      | KZ | 2 | 2P+0C | Z | PV |
| 11Y1TG | <b>Graph Theory</b><br><i>Lucie Kárná Lucie Kárná</i>  | KZ | 2 | 2P+0C | L | PV |
| 14Y1TI | <b>Creating Interactive Internet Applications</b>  | KZ | 2 | 2P+0C | L | PV |
| 14Y1UP | <b>Editing of Theses in MS Word</b>  | KZ | 2 | 2P+0C | L | PV |
| 18Y1UK | <b>Introduction of Rail Vehicles</b><br><i>Josef Kolá</i>  | KZ | 2 | 2P+0C | L | PV |
| 12Y1VC | <b>Waterways and Shipping</b>  | KZ | 2 | 2P+0C | Z | PV |
| 23Y1VS | <b>Negotiation and Cooperation</b><br><i>Milena Macková</i>  | KZ | 2 | 2P+0C | Z | PV |
| 14Y1VM | <b>Development of Applications for Mobile Devices</b>  | KZ | 2 | 2P+0C | Z | PV |
| 16Y1VT | <b>Development in Railroad Vehicles</b><br><i>Jaroslav Opava</i>   | KZ | 2 | 2P+0C | L | PV |
| 14Y1WG | <b>Webdesign</b>   | KZ | 2 | 2P+0C | Z | PV |
| 14Y1W1 | <b>Webdesign 1</b>   | KZ | 2 | 2P+0C | Z | PV |
| 14Y1W2 | <b>Webdesign 2</b>   | KZ | 2 | 2P+0C | L | PV |
| 16Y1ZG | <b>Introduction into Applied Computer Graphics</b><br><i>Adam Orlický, Stanislav Novotný, Ond ej Piksa</i> | KZ | 2 | 2P+0C | L | PV |
| 14Y1ZM | <b>Fundamentals of parametric and adaptive modeling</b>  | KZ | 2 | 2P+0C | L | PV |
| 11Y1ZM | <b>Foundation of MATLAB Programming</b><br><i>Pavla Pecherková</i>   | KZ | 2 | 2P+0C | L | PV |
| 14Y1ZJ | <b>Fundamentals of programming in JAVA</b>   | KZ | 2 | 2P+0C | Z | PV |
| 12Y1ZU | <b>Principles of Urbanism</b><br><i>Karel Hájek</i>  | KZ | 2 | 2P+0C | Z | PV |
| 15Y1ZV | <b>East-West dichotomy: Prelude to the Cold War</b><br><i>Eva Rezlerová, Jan Feit, Marie Michlová</i>      | KZ | 2 | 2P+0C | Z | PV |
| 16Y1ZL | <b>Vehicle Testing, Legislation and Construction</b>   | KZ | 2 | 2P+0C | Z | PV |

**Characteristics of the courses of this group of Study Plan: Code=Y1-BLED 20/21 Name=PVP bak.prez.LED 20/21**

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|--|--|----|---|
| 21Y1AM   | <b>Aeronautical Information Management (AIM)</b>             | KZ | 2 |
| Definition and basic overview of AIS and AIM. Transition from AIS to AIM. Regulatory base. Provision of AIS/AIM in the Czech Rep. AIP (Aeronautical Inf. Publication). VFR Manual of the Czech Rep. AIRAC System. NOTAM messages. PIB (Pre-flight Information Bulletin). AIC (Aeronautical Inf. Circulars). Aeronautical Charts. EAD (Europeana AIS Database). QMS (Quality Mng. System). ADQ (Aeronautical Data Quality). AIXM (Aeronautical Inf. Exchnage Format). |  |    |   |
| 20Y1AF   | <b>Alternative Forms of Transportation Project Financing</b> | KZ | 2 |
| In will be specified such forms of financing in transportation and telecommunications, where the public sector body perform the final debtor, i. e. debt payments come from its budget but the final debtor is not a direct participant of the transaction and it is not the counterparty of the financial institute which provides the funding. Issue of securities as an alternative source of transportation and telecommunication projects.                      |  |    |   |
| 18Y1AM   | <b>Anatomy, Mobility and Safety of Man</b>                   | KZ | 2 |
| Survey of tissues. Anatomical structure and growth of bones. Articular joint. Remodelling of bone tissue. Anatomical structure of muscles. Blood circulation and nervous system. Structure and biomechanics of muscular-skeletal system. Injury of human organs and musculo-skeletal system during traffic accidents. Mobility of ill and injured man and his treatment. Human joint prostheses. Protective means and traffic safety regulations.                    |  |    |   |
| 14Y1AV   | <b>Animation and Visualization</b>                           | KZ | 2 |
| Advanced modifications and modeling of NURBS, Patch objects, selection of objects (according to filter and properties). 3D Studio MAX systems and Space Warp objects. Atmospheric and other effects, rendering filters, Motion blur, advanced animations, Motion panel. Modeling for morphing and animation, bone formation, animation using Inverse Kinematics.   |  |    |   |
| 20Y1AE   | <b>Applied Electronics</b>                                   | KZ | 2 |
| Basic electronic semiconductor components, their principles, characteristics and typical connection diagrams. Semiconductor PN junction diodes, transistors, thyristor, operational amplifiers, basic logic gates. Functions of basic electronic circuits and methods for their designs (rectifiers, voltage regulator with Zener diode, transistor as an amplifier, operational amplifier as an inverting and noninverting amplifier).                              |  |    |   |
| 14Y1BE   | <b>Barrierless Transport</b>                                 | KZ | 2 |
| The issue of barrierless accessible public transportation in terms of architectural barriers and also for transportation-technological point of view. Students will gain theoretical knowledge of barrierless environment roads, railway stations, public transport stops, terminal buildings, vehicles, public transport, information and orientation systems and transportation technology. Theoretical knowledge will be supplemented by practical examples.      |  |    |   |
| 21Y1BC   | <b>Aviation safety and security</b>                          | KZ | 2 |
| History of safety and security development in aviation. Modern tools for safety and security management. Research and development of safe and secure systems.  |  |    |   |

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| 15Y1BO  | Work Safety and Health Protection in Transportation    | KZ | 2 |
| Fundamental legislative, definition of terms, risks and possible health damage, working conditions and health protection with focus on transportation. Health protection programmes, health insurance of home and foreign business trips, statistics, working practice.   |  |    |   |
| 11Y1BK  | Error Detection Codes for Interlocking Systems         | KZ | 2 |
| Safe communication and methods for its assuring. Safety codes – linear codes, cyclic codes, BCH codes, Reed-Solomon codes. Transmission channels, detection of transmission errors, probability of undetected error. Design and assessment of detection codes; requirements of the European standard EN 50159.  |  |    |   |
| 21Y1BS  | Unmanned aircraft systems 1                            | KZ | 2 |
| Unmanned Aviation Development. Aircraft design. Legislation in force in the Czech Republic. Planning and execution of the flight. Airspace division. Operational risks and operational procedures. Practical flights.   |  |    |   |
| 14Y1BM  | Biometric Methods                                      | KZ | 2 |
| Basic biometric terms, authentication methods, principles and performance measurement of biometric systems, overview of biometric technologies, hand geometry, iris recognition, retina recognition method, 2D and 3D face recognition, vein patterns on the wrist, ear biometrics, fingerprint recognition, skin spectroscopy, behavioral methods, the use of biometrics in transport applications, safety and risks of biometric technologies.                  |  |    |   |
| 23Y1DZ  | Data and Their Processing for Engineering Fields Needs | KZ | 2 |
| Courses of risk, basic terms, data collection, data sets, data random uncertainty and data epistemic uncertainty, data processing, hazard, risk, value scales, analytical, empirical and heuristic methods, hazard determination and risk determination, methods for variants' creation, decision support systems.  |  |    |   |
| 15Y1DZ  | History of Railway                                     | KZ | 2 |
| Horse-drawn railways, steam railways, railway network development in the 2nd half of 19th century, regional railways epoch, railways of the "First Republic", electric traction, World War II railways, railway development in the 2nd half of 20th century, high-speed railway origins, railway lines closing, important long-distance train connections, railway lines construction, railway accidents, railway junctions. Excursions and projections.          |  |    |   |
| 12Y1DS  | Project Documentation in Practice                      | KZ | 2 |
| Project documentation creating. Project documentation types. Support materials for project documentation creating. Building permit obtaining process. Budget and pricing. Practical creation of some project documentation parts.   |  |    |   |
| 17Y1EV  | Public Sector Economy                                  | KZ | 2 |
| Economic and financial theory of public sector, public choice theory, externalities, decisions about public finance allocation, economic assesment of public projects (CBA, MCA, CEA), tax system of the CR, state budget, management of public projects a their economic efficiency assessment, way of elaboration of PPP projects, funding from EU funds, program HDM-4.  |  |    |   |
| 20Y1EK  | Qualification in Electrical Engineering                | KZ | 2 |
| Practical experience with measurements in laboratories, electrical equipment, power supply, electrical installation of low voltage, electric shock hazard, symbols and labeling, nominal voltage, maximum allowed currents, electrical equipment protection against short circuit and overload protection, control and revision, first aid, legislation, standards and regulations in relation to health and safety and electrical engineering.                   |  |    |   |
| 16Y1EN  | Energy Requirements of Vehicles                        | KZ | 2 |
| Dynamics and the driving inertial of the vehicles. Types of energy - kinetic, static, heat, chemical and others. Ways of energy change into kinetic energy. Combustion engine, electric drive, steam engine, air engine. Energy accumulation means, accumulator, flywheel, fuel cell. Energy recuperation. WTW analysis.  |  |    |   |
| 20Y1EA  | Environmental Aspects of Transport                     | KZ | 2 |
| State of the atmosphere, weather observation network, weather in transportation, road meteorology. Weather forecasting, data assimilation, probabilistic forecasts, forecast evaluation. Air quality, main pollutants and their effects, atmospheric chemistry, traffic emissions. Greenhouse gasses, carbon cycle, a role of energy and transportation in climate change.  |  |    |   |
| 15Y1EH  | European Integration within Historical Context         | KZ | 2 |
| Versailles system, formation of new states. Europe and the powers, League of Nations. European policy in the 1920s. Fascism, nazism, communism. Little Entente, its principles and goals. Europe after Hitler's getting to power, system of bilateral agreements. Decline of the LN. Rearrangement of powers during WWII. Cold war and its consequences for Europe. New quality of French-German relationship - a driving power of starting European integration. |  |    |   |
| 18Y1EM  | Experimental Methods in Mechanics                      | KZ | 2 |
| The purpose and role of experimental mechanics. Sensors for mechanical testing. Overview of experimental methods. Destructive and non-destructive testing of materials. Design of experimental procedures and sample preparation. Tensile and bending tests. Electrical resistance strain gages. Optical based strain measurement. Fatigue and lifetime prediction. Instrumented hardness testing. Introduction to electron microscopy. Errors in measurement.    |  |    |   |
| 21Y1FN  | Factors Affecting the Rate of Accidents in Aviation    | KZ | 2 |
| Introduction. The scope of international and national organizations in civil aviation. The scope of the investigation organisations within the state and international committees. Analysis and interpretation of ICAO Annexes 13 and 19. Analysis and interpretation of the Regulation (EC), Regulation (EU). Human factor. Utilization of information from the investigation reports.   |  |    |   |
| 15Y1FD  | French Area Studies and Transportation                 | KZ | 2 |
| France - geography and regions, transport infrastructure. Paris and its sights, city public transport. Road traffic, motorways, railway traffic, TGV, air traffic, specialised terminology. French society and culture. Current political system. System of education, studying in France. Selected authors of French literature. French gastronomy.  |  |    |   |
| 14Y1HW  | Computer Hardware                                      | KZ | 2 |
| Computer architecture, basics of logical circuits design and their realization using FPGA. In detail, description of computer architecture and separate parts designing - controllers, arithmetic and logical units, I/O subsystem.   |  |    |   |
| 15Y1HL  | History of Civil Aviation                              | KZ | 2 |
| Beginnings of flying, development of aircrafts lighter than air. Beginnings of aircrafts heavier than air. Czechoslovak aviation pioneers. Development of airports in the Czech Republic. World airports. Famous aviators. Helicopters. CSA airplanes. Development of aircrafts in Czechoslovakia between the years 1945-1989. Classic era of aviation. Golden era of civil aviation. Modern era of civil aviation. Airline companies. Supersonic flying.         |  |    |   |
| 15Y1HD  | History of City Mass Transport                         | KZ | 2 |
| History of city mass transport in the world, development of tram, bus and trolley-bus systems. History of transport networks in the world, current trends and developments of tariff and clearance systems. History of city transport in Prague and Brno. History of tram, bus and trolley-bus operation systems in the Czech Republic and Slovakia.  |  |    |   |
| 12Y1HD  | Traffic Noise  | KZ | 2 |
| Acoustic introduction, basic terms, quantities. Basics of physiological acoustic, noise impacts on human body. Acoustic legislation, standarts, regulations. Creation acoustic climate in area, principles of urban acoustic, noise transmission, soundproofing. Types of noise sources in area. Determination of acoustic situation in the area of interest. Methodology of computing and measurement of transport noise. Acoustic studies, measuring protocol.  |  |    |   |
| 15Y1HE  | Work Hygiene and Ergonomics in Traffic                 | KZ | 2 |
| Basic knowledge of occupational hygiene and ergonomics, and their application in transport. Working environment factors, and the influence of these factors on health of workers. Creation and protection of working conditions that do not damage public health. Mutual links: man-machine-environment. Adaptation of technology to possibilities and skills of a man. Practical examples from the field of transportation; relevant legislature.                |  |    |   |
| 16Y1IS  | Interactive simulators and simulations                 | KZ | 2 |
| Simulation theory and application of computing equipment. Creating computing models. Mechanical and dynamic systems and their mathematical models. Computing methods. Simulation of vehicle dynamics, on-land carriage in particular. Virtual reality systems. Practical exercise with simulation software and interactive simulators.  |  |    |   |

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| 12Y1KN  | Combined Transportation                                       | KZ | 2 |
| Combined transport strategy and legislation. Load units. Means of transport in combined transport. Combined transport systems. Transshipping areas. Multimodal logistic centres.  |   |    |   |
| 20Y1KP  | Communication and presentation skills                         | KZ | 2 |
| Motivation, priorities and their fulfillment, current communication networks, work with various sources, formal requirements of emails and final theses, basic typology of personalities, teamwork, emotional intelligence, manipulation and way of working with it, coping with stressful situations, formal requirements of presentations, ways of communication during presentation, presentation skills, presentation skills in online environment. |   |    |   |
| 23Y1KM  | Crisis Management   | KZ | 2 |
| Theory and legal frame of crisis management with direction to Rescue system (IZS). After introduction to safety domain, there are terms and knowledge on: theory and position of crisis management and its targets; IZS-crisis management-crisis planning; and basic legislation. Practical part is concentrated to responsibility matrix compilation.  |   |    |   |
| 23Y1KO  | Quantum Physics and Optoelectronics                           | KZ | 2 |
| Ground of quantum physics. Application of quantum physics in practice. Optoelectronics. Production of optoelectronics components.   |   |    |   |
| 17Y1LL  | Logistics of Passenger and Freight Air Transport              | KZ | 2 |
| Logistics airline passenger and cargo. Aircraft and airport terminals for passenger and cargo transport. Airlines in terms of logistics systems. Aerial transport process passengers and air cargo. Information systems in air transport. Global distribution systems.  |   |    |   |
| 20Y1LN  | Location and Navigation                                       | KZ | 2 |
| Description and examples of road networks, localization on the network. Routing algorithms, their properties and implementation. Description and examples of datasets for finding transport connections, routing algorithms, their properties and implementation.   |   |    |   |
| 21Y1MZ  | Managerial Ethics   | KZ | 2 |
| The basic terminology of managerial ethics. Basics of etiquette and rules of social contact. Social events. Etiquette of working contacts. The art of presentation and negotiation. Personal image. Diplomatic protocol. Managerial ethics. Business ethics.  |   |    |   |
| 17Y1MD  | Marketing in Transportation                                   | KZ | 2 |
| General principles of marketing applied to transport issues, marketing tools suitable for transport as a service, specifics of public passenger transport and the resulting differences in the application of marketing.  |   |    |   |
| 11Y1MM  | Mathematical Models in Economy                                | KZ | 2 |
| The goal of the course is to teach selected methods of linear programming, with theoretical procedures applicable for individual tasks and their program implementation. The outcome of the course is the ability to implement and solve basic tasks from the queue theory, graph theory and both free and constrained optimization.  |   |    |   |
| 18Y1MT  | Engineering Materials   | KZ | 2 |
| Systematic overview of main classes of materials used in technical design. In addition to main classes of materials, i. e. metals, ceramics, polymers and composites, attention is paid to biological materials and to biomimetics. Integral approach to material selection process is also demonstrated based on so called Ashby's selection charts.   |   |    |   |
| 21Y1MP  | Matlab for project-oriented study                             | KZ | 2 |
| The subject's syllabus is focused on the problem-solving during bachelor's thesis preparation and it is based on students' requests. Individual exercises will be prepared according to particular examples, based on actual students' needs and suggestions. The subject will have a flexible form, which is expected to bring an improvement of students' Matlab skills.  |   |    |   |
| 14Y1MP  | Modeling Complex Assemblies and Models in Parametric Modeller | KZ | 2 |
| Assemblies programming - tools and methodology of working subassemblies and assemblies, sheet metal parts modelling, welded assemblies, pipelines, and distribution lines. Photorealistic output rendering - physical and material properties, lighting sources. MKP - visual example.  |   |    |   |
| 15Y1MK  | Modern History in Context: Every Day Life and Transport       | KZ | 2 |
| Historical overview of modern history of every day life, science, technology and transport in a wider context.  |   |    |   |
| 15Y1NE  | German in the Economy and Society                             | KZ | 2 |
| Recent economic and social issues of German speaking countries and of the EU. Reading and listening of texts. Lexical, grammatical and semantic analysis of texts. Discussion on selected topics.   |   |    |   |
| 23Y1OK  | Protection of Critical Objects and Infrastructures            | KZ | 2 |
| Types of technological systems, critical item, risks and their courses, criticality, vulnerability, connectivity, dependability, resilience, failure, protection, safety of critical objects and critical infrastructures.  |   |    |   |
| 20Y1OI  | Fare Collection and Information Systems                       | KZ | 2 |
| Fare collection systems in public transport and their components (on-board units, validators, turnstiles, ...). Information systems and their components for users (timetables, maps, panels ...) and operators (cycles, location or current delay of vehicles, ...). The issue of tariff systems. Other examples of clearance systems (parking).   |   |    |   |
| 14Y1OJ  | Object - oriented programming in JAVA                         | KZ | 2 |
| Objective thinking. Encapsulation. Classes. Attributes. Access modifiers. Methods and overloading. Special methods (constructors, getters / setters ...). Basic object methods. Reference data types. Inheritance. Polymorphism. Statics, constants, interfaces, abstract classes, enum, packages, exceptions, collections, generics, lambda expressions, anonymous functions.  |   |    |   |
| 14Y1OP  | Operating System  | KZ | 2 |
| Distributions. Installation GNU/Linux OS. X-window system. Rights management - users and groups, ACL rights. Filesystems and attributes. Programs and processes. OS boot, runlevels. Basic console programs / commands. Config files. SW management, package systems. Programs in graphic shell - text, spreadsheet, graphic editors, sound, video and communication. Services management. Safe and secure configuration of OS. Remote administration.  |   |    |   |
| 17Y1OF  | Personal Finance  | KZ | 2 |
| Personal finance (budget, financing of basic living needs), debt (loans and credits, payment instruments, interest and fees, debt trap), financing of housing (rent, mortgage, savings, consumer loans, refinancing), savings and investments (investment horizon, return, risk, investment strategy), insurance (insurance types, suitability and adequacy), securing the future (retirement savings and insurance).                                   |   |    |   |
| 20Y1OK  | Road Lighting   | KZ | 2 |
| Basic lighting quantities and terms, street lighting components (luminaires, control cabinets for street lighting, street lighting cables), characteristics of luminaires (lifetime of light sources, light distribution), standards, measurement of illuminance and luminance in road lighting, tunnels, conceptual approach to street lighting design, lighting calculations in DIALux and Relux, street lighting control systems.                    |   |    |   |
| 11Y1PV  | Parametrical and Multicriterial Programming                   | KZ | 2 |
| Solution to the problem of linear programming with a parameter in objective function, on right sides and in the matrix of coefficients of linear constraints. Computation of efficient solution.  |   |    |   |
| 17Y1PM  | Personnel Management  | KZ | 2 |
| Human sources, work group, man as personality, planning, choice, evaluation and education of human sources, work adaptation, teamwork, intercultural communication.   |   |    |   |
| 12Y1PC  | Pedestrian and Cycling Transport                              | KZ | 2 |
| Routes for pedestrians. Pedestrian crossings. Modifications for blind, dim-sighted and disabled people. Design of cycle routes network. Ways of cycle route layout and design parameters for cyclists. Separation of cyclists from other transport modes. Cycle tracks and its design - one way streets, reserved traffic lanes, bus stops, crossings with other transport modes, crossroads. Traffic signs and road marking for cyclists.              |   |    |   |
| 14Y1PG  | Computer Graphics   | KZ | 2 |
| Basic formats of graphic and possibilities of their editing and mutual conversion. Use of individual types according to character of work. Work with editing programs (within the user level scope) using layers, DPI, colors. Basics of digital photography, scanning and computer technology like monitors and graphics cards.  |   |    |   |

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| 14Y1P2  | Computer Aid of Transportation Projecting 2         | KZ | 2 |
| Overview of CAx application for transportation projecting aid. AutoCAD environment possibilities of basic tasks automatizing (programming, scripting, data exchange). Advanced blocks modification (attributes, relation to databases). Work in projecting group, external references. Basic tasks for cummunication projecting (clotoidic transition curve, cross-and longitudinal section). Basics of 3D modelling.   |   |    |   |
| 18Y1PS  | Computer Simulations in Mechanics                   | KZ | 2 |
| Principles and overview of tools for stress analysis of structures. Numerical methods in mechanics, finite element method. Geometric model development and adaptation of geometry from other CAE systems. Assignment of material properties. The types of elements and their use. Discretization of solid model. Boundary conditions and application of the load. Basic tasks of structural and modal analysis. Introduction to complex nonlinear problems.       |   |    |   |
| 14Y1PI  | Corporate Information System                        | KZ | 2 |
| Data-information-knowledge, components of information system, syntatic and semantic sense of data, structure of corporate information system, particular information system (personalistic, production, storage, etc.), corporate information politic and information control, risks of information system operation, legal environment of information system operation, state information system, information system security, data protection, safety politics. |   |    |   |
| 14Y1PZ  | Advanced Data Processing in Spreadsheets            | KZ | 2 |
| Students will be familiar with principles of working in a spreadsheet. Graphic layout of the table appearance, formatting of numbers, insertion of formulas and functions, including addressing, error detection. Working with large spreadsheets, filters, advanced filters, database functions. Pivot tables and charts, conditional formatting, solution finding, solver, macros, data analysis. Examples and questions from various companies and training.   |   |    |   |
| 12Y1PD  | Assessment of Transport Structures                  | KZ | 2 |
| Assessment of transport structures, the EIA process. Multicriteria assessment methods, risk analysis, SWOT analysis. Landscape character, possibilities of its protection and assessment transport structures on the landscape. Rating fragmentation and landscape connectivity in the preparation of linear structures. Practical examples of assessment of traffic buildings on the environment.  |   |    |   |
| 20Y1PK  | Product Quality Management Processes                | KZ | 2 |
| General principles of organization management. Management systems and international standards; quality management systems. Quality products, processes, systems. A framework of standards for systems management, management principles. Principles of process management, monitoring and measurement systems management. Uniform framework of standards for systems management. Process management principles. Metrology and testing. Product certification.     |   |    |   |
| 14Y1PJ  | C Programming Language                              | KZ | 2 |
| C programming language. Preprocessor, basics of the C language (data types, syntax, commands), functions, pointers, dynamical memory allocation, string, files, structures and unions. Implementations of abstract data types (FIFO, LIFO, list), programming techniques (sorting, searching, recursion), using bitwise operators.  |   |    |   |
| 12Y1C1  | Designing Roads in Civil 3D I                       | KZ | 2 |
| The course is devoted to the traffic buildings design field, specifically the design of roads as such, by the means of a 3D software. Students go through the complete design of this particular linear building, from the initial situation, over the longitudinal section, to the model and work sections and the cubic capacity calculation. The course also includes a basic explanation of the traffic building design in the real-life profession.          |   |    |   |
| 12Y1C2  | Designing Roads in Civil 3D II                      | KZ | 2 |
| The course is devoted to the traffic buildings design field, specifically the design of roads as such, by the means of a 3D software. Students go through the complete design of this particular linear building, from the initial situation, over the longitudinal section, to the model and work sections and the cubic capacity calculation. The previously acquired skills are improved and developed. Students learn to design intersections.                |   |    |   |
| 14Y1PA  | 3D Modeling in AutoCAD                              | KZ | 2 |
| Work in 3D non-parametric modeller (AutoCAD) environment, scenes rendering, creation of planar and volumetric objects, user setup creation, object data creation, work with data connected with external database. Basic definition of work with lights, materials and reflexes. Models presentation.   |   |    |   |
| 16Y1PV  | Operation, Construction and Maintenance of Vehicles | KZ | 2 |
| Methods of vehicle production. Vehicle maintenance. Vehicle diagnostics. Maintenance and repair plans. Engine maintenance and emission measurement. Transmission mechanism. General principles of engine diagnostics.   |   |    |   |
| 21Y1PA  | Air Traffic Control Operating Procedures            | KZ | 2 |
| Practical exercises on the ATC simulator with the following focus - getting familiar with the simulation environment, acquiring basic habits, aircraft identification procedures, vectoring, level changes, ATC clearance, use of RNAV points. Practical exercises focused on the basis of vectoring, timely application of vertical spacing, EST and REV message transmission. Exercises in the APPROACH airspace, arrivals, departures and conflict solutions.  |   |    |   |
| 12Y1PU  | Organization Disposition of Railway Stations        | KZ | 2 |
| Connecting station. Passenger transport equipment. Freight transport equipment. Branch lines and railway traffic inside industrial company areas. Zone stations. Formation yards. Reserve stations. Technology of work in railway station with regard to its disposition. Railway station documentations in the Czech Republic railway network.   |   |    |   |
| 12Y1RU  | Railway Lines Reconstruction                        | KZ | 2 |
| Keeping railway line operational, maintaining lines and stations, geometrical alignment of railway line, vehicles for railway superstructure and substructure maintenance, scheduling and organising possessions, preparation of railway lines reconstruction and maintenance, process of railway line reconstruction.  |   |    |   |
| 16Y1RE  | Control and Electronic Vehicle Systems              | KZ | 2 |
| Elementary concepts of regulation. Tools for analytical solution, linear system description. Basic types of a regulator (PID), properties, advantages, disadvantages, function. Conventional and hybrid drive control. Electric drive. Vehicle communication bus (CAN, LIN, FlexRay, ISObus, KWP2000 protocole etc.). Vehicle electronic control, safety, communication and comfort systems.  |   |    |   |
| 21Y1RZ  | Human Resources Management                          | KZ | 2 |
| The position of human resources in the organization and related disciplines file. Substance, importance and challenges of human resources management. Internal and external environment of human resource management. Human resource planning. Search, recruitment and selection of employees. Motivation, evaluation and remuneration of staff. Positioning, dismissal and redundancies of employees. Education of employees. Planning career management.        |   |    |   |
| 17Y1ST  | Titan Simulation                                    | KZ | 2 |
| Titan is a management game simulating the business decisions. Lets 2-8 student groups to produce and compete in the market with the same product. Students set a price and determine the quantity and capacity of production, plan budgets for marketing, research and development. They become familiar with the consequences of their decisions by the form of financial corporate reports and they use this information for other business decisions.          |   |    |   |
| 20Y1SC  | Sensors and Actuators                               | KZ | 2 |
| Principles of sensors and actuators. Basics of measuring theory and actuating influence. The respective technologies and construction principles. Sensors of mechanical, electro-magnetic, state (temperature, humidity), chemical and particle flow values. Electrical, pneumatic and hydraulic actuators and solid phase elements.  |   |    |   |
| 17Y1SL  | Sociology of Human Resources                        | KZ | 2 |
| Human resources and their importance, work group as a special kind of social group, communication, personal management, modern management, human resources planning, culture of the organization.   |   |    |   |
| 11Y1SI  | Transportation Software Engineering                 | KZ | 2 |
| Basic concepts of software engineering, ranging from domain analysis, requirement analysis and software architectures to analyses, design and implementation using formal techniques and practical usage.   |   |    |   |

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|--|--|----|---|
| 16Y1KS   | Quality and Reliability of Vehicles              | KZ | 2 |
| Quality and reliability theory in design, development, production and operation of vehicles. Definition and possible approach to quality and reliability. Key legislation. FMEA (Failure Mode and Effects Analysis), QFD (Quality Function Deployment), DFx (Design for Assamly, Manufacturing, Quality, Services ...) and other methods used in industrial applications. Knowledge-based systems of quality and reliability, data collection.                                   |  |    |   |
| 12Y1SU   | Road Management and Maintenance                  | KZ | 2 |
| Getting familiar with ownership of roads in the Czech Republic and the administration of the road at the state and county level. It is presented development of road network, short, medium and long-term strategy of the Ministry of Transport. Maintenance of roads winter and summer, its requirements, specifics, possibilities and repair methods are discussed in the classroom as well as investment activity in highway engineering.                                     |  |    |   |
| 17Y1SK   | Urban and Regional Rail Transport Systems        | KZ | 2 |
| Factors affecting transport demand, modal-split, distribution of passenger flows on public regional transport lines. Optimization of line management, line networking. Creating and evaluation of the timetable. Vehicle circulation creation. Optimizing driver shifts and arranging them in turnus. Effects of barrier-free and public transport preferences. The role of marketing.   |  |    |   |
| 21Y1TH   | Aircraft Technical Handling                      | KZ | 2 |
| Aircraft towing and pushing tractors. GPU. Air conditioning and heating units. Aircraft fuel equipment. De-icing and anti-icing units. Loading and unloading units. Equipment for passengers onboarding and offboarding. Operational processes of aircraft technical handling and regulations. Modernization and technical progress.   |  |    |   |
| 11Y1TG   | Graph Theory                                     | KZ | 2 |
| Basic concepts and terminology of graph theory, graph representation. Problems of graph theory, problem instance. Graph search algorithms, trees, minimum spanning tree, shortest path problem, Eulerian path, bipartite graph matching, flow networks, circulations, critical path method, traveling salesman problem. Problem of existence and optimization and algorithms for their solving. Computational complexity, dealing with NP-complete problems, heuristic approach. |  |    |   |
| 14Y1TI   | Creating Interactive Internet Applications       | KZ | 2 |
| Possibilities of scripting language PHP. Overview of PHP language syntax, and functions. Analysis of finished scripts and demonstration of solutions. Your own application programmed in PHP language.   |  |    |   |
| 14Y1UP   | Editing of Theses in MS Word                     | KZ | 2 |
| Students will be introduced to the principles of creating and editing large documents and basic typographic rules. They will properly apply styles, create tables of contents, lists of figures, tables, graphs, etc. Footnotes, captions, index. They practice corrections of finished documents. The goal is to prepare students for seamless editing dissertations and theses, so that they are able to concentrate mainly on writing a thesis.                               |  |    |   |
| 18Y1UK   | Introduction of Rail Vehicles                    | KZ | 2 |
| Basic characteristics and parameters rail transport systems - railway and urban transport. Basis driving mechanics rail vehicles - equation of motion train and unit trains. Rolling and track resistance. Total running resistance. Acceleration force. Analyzing driving cycle rail vehicle. Speed-power diagrams and characteristics rail vehicle - hydromechanic, hydrodynamic and electric drive. Design concept rail vehicles and drive of wheel set.                      |  |    |   |
| 12Y1VC   | Waterways and Shipping                           | KZ | 2 |
| Basic modes of transport. The position of water transport in the transport system of the Czech Republic and the EU. Advantages and disadvantages of water transport. Basic systems of waterways in Europe, a network of waterways in the Czech Republic. Construction of the waterway and its equipment. Management of waterways and its operation. The legal regime in inland navigation, navigation rules of operation, navigation maps.                                       |  |    |   |
| 23Y1VS   | Negotiation and Cooperation                      | KZ | 2 |
| Code of conduct for negotiation. The influence of personality traits on the negotiations. Negotiation and commanding. Teamwork. Variants teams. Informal and formal role in the team. Principles of negotiation, the essence of negotiation, the differences in negotiation in business and in crisis situations, the principle of "win both", specifications and bidding, the role of trust.  |  |    |   |
| 14Y1VM   | Development of Applications for Mobile Devices   | KZ | 2 |
| Object oriented programming, Java programming language, development environment, operating system Android, development application - widgets, containers, threads, menu, permissions, services, GUI.   |  |    |   |
| 16Y1VT   | Development in Railroad Vehicles                 | KZ | 2 |
| Railroad vehicles traction. Railroad vehicle parametres regulation. Control and driving of railroad vehicles. Importance in heavy duty and personal transportation. Critical situation assesment. New materials in design. International standardization.  |  |    |   |
| 14Y1WG   | Webdesign  | KZ | 2 |
| Students will learn the basics of HTTP communication, URL and addressing, HTML5 markup language, advanced CSS3 techniques, accessible and usable web rules, responsive webdesign, content management systems, web server installation + configuration directives. The subject matter will be trained on examples.  |  |    |   |
| 14Y1W1   | Webdesign 1                                      | KZ | 2 |
| Students will learn the basics of communication HTTP, URL and addressing, markup languages HTML and XHTML, HTML tags, rules of web accessibility and usability, CSS properties and selectors, the issue of web browsers, creating one to three column layout pages, sites validation, conditional comments. Topics will be practiced on practical examples.  |  |    |   |
| 14Y1W2   | Webdesign 2                                      | KZ | 2 |
| Students will learn advanced techniques CSS, responsive webdesign, CSS frontends, content management systems, JavaScript, jQuery, SEO, web server installation + configuration directives. Topics will be practiced on practical examples.   |  |    |   |
| 16Y1ZG   | Introduction into Applied Computer Graphics      | KZ | 2 |
| Computer graphics, division and applications with emphasis on transport, including development and research. Colours, colour perception, colour schemes, models, principles of 2D and 3D generation, elementary algorithms for graphic data workout. Visualisation principles and tasks, technics, graphics and visualisation HW basics. Introduction to 2D and 3D graphics software.  |  |    |   |
| 14Y1ZM   | Fundamentals of parametric and adaptive modeling | KZ | 2 |
| Basics of work at products and parts creation. Sketch drawing by help of geometric relations, parametric dimensions, creation of adaptive models from 2D sketches. Import and export from and to another systems. Fundamentals of assemblies creation.   |  |    |   |
| 11Y1ZM   | Foundation of MATLAB Programming                 | KZ | 2 |
| To explain the principle of algorithmization, flow charts, description of MATLAB environment and its settings, MATLAB help, mathematical operators, matrices and elements operations, control flow, inputs and outputs, graphics, optimization and program code debugging.   |  |    |   |
| 14Y1ZJ   | Fundamentals of programming in JAVA              | KZ | 2 |
| Introduction to the Java SE Platform. IDE Installation and First Project. Comments. Variables and Type System. Operators. User Input and Parsing. Chain and Chain Conversion. Text Chain and Mathematical Methods. Terms. Relational Operators and Switches. Cycles for, while, foreach. Field - declaration, initialization, methods for field work. ASCII. Functions, parameters, return value, recursion. Program creation.   |  |    |   |
| 12Y1ZU   | Principles of Urbanism                           | KZ | 2 |
| Survey on history of city and settlement building. Functional components and their mutual relations (working, living, recreation, transportation). Spacial arrangement of settlements. Types of towns or cities with a certain prevailing function, forms of their development. Brief overview of land-use planning.   |  |    |   |

|        |   |    |   |
|--------|---|----|---|
| 15Y1ZV | East-West dichotomy: Prelude to the Cold War<br>Historical prologue, evolution of the "West" and "East" from the 1500s. Focus on the history in the period between 1850 nad 1950. Milestones and continuity of the international relations in the end of 19th century and the beginning of the 20th century. Revolutions, the causes and consequences. Scientific and technological progress, the causes and consequences. Economic and financial history. Social changes. Discussions on texts, sources. | KZ | 2 |
| 16Y1ZL | Vehicle Testing, Legislation and Construction<br>Vehicle, bus and motorbike construction, aggregate computing, driving resistance, build and parameters of traction, constructional arrangement of personal cars, trucks, buses, motorbikes, legislation in the EU and in the world, technical legislation creation, testing methods, vehicle tests, accelerated tests, mathematical modelling in testing.  | KZ | 2 |

Name of the block: Jazyky

Minimal number of credits of the block: 6

The role of the block: J

Code of the group: JZ-B-3,4 16/17

Name of the group: Jazyk bak. 5., 6.sem. (od) 16/17 (pro B3710)

Requirement credits in the group: In this group you have to gain 6 credits

Requirement courses in the group: In this group you have to complete 2 courses

Credits in the group: 6

Note on the group:

| Code   | Name of the course / Name of the group of courses<br>(in case of groups of courses the list of codes of their members)<br>Tutors, authors and guarantors (gar.) | Completion | Credits | Scope    | Semester | Role |
|--------|---|------------|---------|----------|----------|------|
| 15JZ3F | Foreign Language - French 3<br>Eva Rezlerová, Jan Feit, Irena Veselková   | Z          | 3       | OP4C+10B | Z        | J    |
| 15JZ3I | Foreign Language - Italian 3<br>Irena Veselková   | Z          | 3       | OP4C+10B | Z        | J    |
| 15JZ3N | Foreign Language - German 3<br>Eva Rezlerová, Jan Feit, Jana Štikarová, Barbora T hníková, Ester Prokešová  | Z          | 3       | OP4C+10B | Z        | J    |
| 15JZ3R | Foreign Language - Russian 3<br>Eva Rezlerová, Jan Feit, Marie Michlová   | Z          | 3       | OP4C+10B | Z        | J    |
| 15JZ3S | Foreign Language - Spanish 3<br>Eva Rezlerová, Jan Feit, Nina Hricsina Puškinová  | Z          | 3       | OP4C+10B | Z        | J    |
| 15JZ4F | Foreign Language - French 4<br>Eva Rezlerová, Irena Veselková   | Z,ZK       | 3       | OP4C+10B | L        | J    |
| 15JZ4I | Foreign Language - Italian 4  | Z,ZK       | 3       | OP4C+10B | L        | J    |
| 15JZ4N | Foreign Language - German 4<br>Eva Rezlerová, Jana Štikarová  | Z,ZK       | 3       | OP4C+10B | L        | J    |
| 15JZ4R | Foreign Language - Russian 4<br>Eva Rezlerová, Marie Michlová   | Z,ZK       | 3       | OP4C+10B | L        | J    |
| 15JZ4S | Foreign Language - Spanish 4<br>Eva Rezlerová, Nina Hricsina Puškinová  | Z,ZK       | 3       | OP4C+10B | L        | J    |

Characteristics of the courses of this group of Study Plan: Code=JZ-B-3,4 16/17 Name=Jazyk bak. 5., 6.sem. (od) 16/17 (pro B3710)

|        |  |      |   |
|--------|--|------|---|
| 15JZ3F | Foreign Language - French 3<br>Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.  | Z    | 3 |
| 15JZ3I | Foreign Language - Italian 3<br>Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation. | Z    | 3 |
| 15JZ3N | Foreign Language - German 3<br>Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.  | Z    | 3 |
| 15JZ3R | Foreign Language - Russian 3<br>Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation. | Z    | 3 |
| 15JZ3S | Foreign Language - Spanish 3<br>Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation. | Z    | 3 |
| 15JZ4F | Foreign Language - French 4<br>Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.  | Z,ZK | 3 |

|  |                              |      |   |
|--|------------------------------|------|---|
| 15JZ4I   | Foreign Language - Italian 4 | Z,ZK | 3 |
| Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation. |                              |      |   |
| 15JZ4N   | Foreign Language - German 4  | Z,ZK | 3 |
| Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation. |                              |      |   |
| 15JZ4R   | Foreign Language - Russian 4 | Z,ZK | 3 |
| Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation. |                              |      |   |
| 15JZ4S   | Foreign Language - Spanish 4 | Z,ZK | 3 |
| Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation. |                              |      |   |

### List of courses of this pass:

| Code   | Name of the course                             | Completion | Credits |
|--|--|------------|---------|
| 11CAL1   | Calculus 1                                     | Z,ZK       | 7       |
| Sequence of real numbers and its limit. Basic properties of mappings. Function of one real variable, its limit and derivative. Geometric properties of n-dimensional Eukclidean space and Cartesian coordinate system. Geometric meaning of the differential of functions several real variables, differential calculus of functions of several real variables.  |  |            |         |
| 11CAL2   | Calculus 2                                     | Z,ZK       | 5       |
| Antiderivative, Newtonian integral, Riemannian integral of the function of one variable, improper Riemannian integral, Riemannian integral in $R^n$ . Parametric description of regular k-dimensional surfaces in $R^n$ , Riemannian integral over regular surfaces. Line and surface integrals of the second type, Stokes theorems, ordinary differential equations of the first order, linear differential equations with constant coefficients and its systems.               |  |            |         |
| 11FYZ  | Physics  | Z,ZK       | 5       |
| Kinematics, particle dynamics, dynamics of particle systems and rigid body. Continuum mechanics, thermodynamics.   |  |            |         |
| 11GIE  | Geometry                                       | KZ         | 3       |
| Differential geometry of curves - parameterization, the arc of the curve, torsion and curvature, Frenet's trihedron. Kinematics - a curve as a trajectory of the motion, the velocity, and acceleration of a particle moving on a curved path.   |  |            |         |
| 11LA   | Linear Algebra                                 | Z,ZK       | 3       |
| Vector spaces (linear combinations, linear independence, dimension, basis, coordinates). Matrices and operations. Systems of linear equations and their solvability. Determinants and their applications. Scalar product. Similarity of matrices (eigenvalues and eigenvectors). Quadratic forms and their classification.   |  |            |         |
| 11MSP  | Modeling of Systems and Processes              | Z,ZK       | 4       |
| Mathematical methods and algorithms as a basis for system analysis. Methods for modelling and evaluating the systems in continuous and discrete time domain. Laplace transform, z-transform, and the recursive algorithms in solution of differential and difference equations, as an instrument for system description. Practical use of technical computing environment (MATLAB).  |  |            |         |
| 11STAT   | Statistics                                     | Z,ZK       | 4       |
| Definition of probability, random variable and its description, known distributions, random vector, function of random variable. Methods of point estimation. Testing of statistical hypothesis. Regression and correlation, linear regression, correlation coefficient, coefficient of determination, the general linear model, statistical inference in linear regression, analysis of variance, multiple regression, the use of matrices in regression.                       |  |            |         |
| 11X31  | Project 1                                      | Z          | 2       |
| 11X32  | Project 2                                      | Z          | 2       |
| 11X33  | Project 3                                      | Z          | 2       |
| 11Y1BK   | Error Detection Codes for Interlocking Systems | KZ         | 2       |
| Safe communication and methods for its assuring. Safety codes – linear codes, cyclic codes, BCH codes, Reed-Solomon codes. Transmission channels, detection of transmission errors, probability of undetected error. Design and assessment of detection codes; requirements of the European standard EN 50159.   |  |            |         |
| 11Y1MM   | Mathematical Models in Economy                 | KZ         | 2       |
| The goal of the course is to teach selected methods of linear programming, with theoretical procedures applicable for individual tasks and their program implementation. The outcome of the course is the ability to implement and solve basic tasks from the queue theory, graph theory and both free and constrained optimization.   |  |            |         |
| 11Y1PV   | Parametrical and Multicriterial Programming    | KZ         | 2       |
| Solution to the problem of linear programming with a parameter in objective function, on right sides and in the matrix of coefficients of linear constraints. Computation of efficient solution.   |  |            |         |
| 11Y1SI   | Transportation Software Engineering            | KZ         | 2       |
| Basic concepts of software engineering, ranging from domain analysis, requirement analysis and software architectures to analyses, design and implementation using formal techniques and practical usage.  |  |            |         |
| 11Y1TG   | Graph Theory                                   | KZ         | 2       |
| Basic concepts and terminology of graph theory, graph representation. Problems of graph theory, problem instance. Graph search algorithms, trees, minimum spanning tree, shortest path problem, Eulerian path, bipartite graph matching, flow networks, circulations, critical path method, traveling salesman problem. Problem of existence and optimization and algorithms for their solving. Computational complexity, dealing with NP-complete problems, heuristic approach. |  |            |         |
| 11Y1ZM   | Foundation of MATLAB Programming               | KZ         | 2       |
| To explain the principle of algorithmization, flow charts, description of MATLAB environment and its settings, MATLAB help, mathematical operators, matrices and elements operations, control flow, inputs and outputs, graphics, optimization and program code debugging.   |  |            |         |



|  |  |      |   |
|--|--|------|---|
| 12MDE  | Transport Models and Transport Excesses      | Z,ZK | 3 |
| Parameters of the traffic flow and methods for their measurement. Models of the traffic flow, communications load, line and urban systems. Theory of queues, shock waves. Quality of transport and its assessment. Statistical characteristics of transport. Transport excesses, their analysis, the causes, identify and minimize the consequences. Improving of transport safety and fluency.  |  |      |   |
| 12PPOK   | Designing Roads, Highways and Motorways      | KZ   | 3 |
| Definition, types, ownership, maintenance, management and categorization of roads and highways. Curve and transition curve. Sinuosity and standard speed. Route in rural areas. Range of vision for stopping and overtaking. Road body - shapes and proportions, bottom and superstructure. Drainage and components of roads. Safety device. Crossings, junctions, intersections.  |  |      |   |
| 12X31  | Project 1                                    | Z    | 2 |
| 12X32  | Project 2                                    | Z    | 2 |
| 12X33  | Project 3                                    | Z    | 2 |
| 12Y1C1   | Designing Roads in Civil 3D I                | KZ   | 2 |
| The course is devoted to the traffic buildings design field, specifically the design of roads as such, by the means of a 3D software. Students go through the complete design of this particular linear building, from the initial situation, over the longitudinal section, to the model and work sections and the cubic capacity calculation. The course also includes a basic explanation of the traffic building design in the real-life profession.         |  |      |   |
| 12Y1C2   | Designing Roads in Civil 3D II               | KZ   | 2 |
| The course is devoted to the traffic buildings design field, specifically the design of roads as such, by the means of a 3D software. Students go through the complete design of this particular linear building, from the initial situation, over the longitudinal section, to the model and work sections and the cubic capacity calculation. The previously acquired skills are improved and developed. Students learn to design intersections.               |  |      |   |
| 12Y1DS   | Project Documentation in Practice            | KZ   | 2 |
| Project documentation creating. Project documentation types. Support materials for project documentation creating. Building permit obtaining process. Budget and pricing. Practical creation of some project documentation parts.  |  |      |   |
| 12Y1HD   | Traffic Noise                                | KZ   | 2 |
| Acoustic introduction, basic terms, quantities. Basics of physiological acoustic, noise impacts on human body. Acoustic legislation, standards, regulations. Creation acoustic climate in area, principles of urban acoustic, noise transmission, soundproofing. Types of noise sources in area. Determination of acoustic situation in the area of interest. Methodology of computing and measurement of transport noise. Acoustic studies, measuring protocol. |  |      |   |
| 12Y1KN   | Combined Transportation                      | KZ   | 2 |
| Combined transport strategy and legislation. Load units. Means of transport in combined transport. Combined transport systems. Transshipping areas. Multimodal logistic centres.   |  |      |   |
| 12Y1PC   | Pedestrian and Cycling Transport             | KZ   | 2 |
| Routes for pedestrians. Pedestrian crossings. Modifications for blind, dim-sighted and disabled people. Design of cycle routes network. Ways of cycle route layout and design parameters for cyclists. Separation of cyclists from other transport modes. Cycle tracks and its design - one way streets, reserved traffic lanes, bus stops, crossings with other transport modes, crossroads. Traffic signs and road marking for cyclists.                       |  |      |   |
| 12Y1PD   | Assessment of Transport Structures           | KZ   | 2 |
| Assessment of transport structures, the EIA process. Multicriteria assessment methods, risk analysis, SWOT analysis. Landscape character, possibilities of its protection and assessment transport structures on the landscape. Rating fragmentation and landscape connectivity in the preparation of linear structures. Practical examples of assessment of traffic buildings on the environment.   |  |      |   |
| 12Y1PU   | Organization Disposition of Railway Stations | KZ   | 2 |
| Connecting station. Passenger transport equipment. Freight transport equipment. Branch lines and railway traffic inside industrial company areas. Zone stations. Formation yards. Reserve stations. Technology of work in railway station with regard to its disposition. Railway station documentations in the Czech Republic railway network.  |  |      |   |
| 12Y1RU   | Railway Lines Reconstruction                 | KZ   | 2 |
| Keeping railway line operational, maintaining lines and stations, geometrical alignment of railway line, vehicles for railway superstructure and substructure maintenance, scheduling and organising possessions, preparation of railway lines reconstruction and maintenance, process of railway line reconstruction.   |  |      |   |
| 12Y1SU   | Road Management and Maintenance              | KZ   | 2 |
| Getting familiar with ownership of roads in the Czech Republic and the administration of the road at the state and county level. It is presented development of road network, short, medium and long-term strategy of the Ministry of Transport. Maintenance of roads winter and summer, its requirements, specifics, possibilities and repair methods are discussed in the classroom as well as investment activity in highway engineering.                     |  |      |   |
| 12Y1VC   | Waterways and Shipping                       | KZ   | 2 |
| Basic modes of transport. The position of water transport in the transport system of the Czech Republic and the EU. Advantages and disadvantages of water transport. Basic systems of waterways in Europe, a network of waterways in the Czech Republic. Construction of the waterway and its equipment. Management of waterways and its operation. The legal regime in inland navigation, navigation rules of operation, navigation maps.                       |  |      |   |
| 12Y1ZU   | Principles of Urbanism                       | KZ   | 2 |
| Survey on history of city and settlement building. Functional components and their mutual relations (working, living, recreation, transportation). Spatial arrangement of settlements. Types of towns or cities with a certain prevailing function, forms of their development. Brief overview of land-use planning.   |  |      |   |
| 12ZTS  | Railway Lines and Stations                   | Z,ZK | 4 |
| Rail transport. Railway track geometry parameters. Route layout of railway lines. Railway line construction - railway substructure and superstructure. Spatial layout of railway lines. Railway control systems in relation to infrastructure. Operating and carriage points. Railway lines net and category. Traction in rail transport.  |  |      |   |
| 12ZYDI   | Introduction to Transportation Engineering   | Z,ZK | 2 |
| Role of transportation in land-use planning. Basic terms in transportation engineering. Traffic survey and traffic prognosis. Introduction to topic of roads, public mass transport. Negative impacts of transportation to environment and safety.   |  |      |   |
| 14ASD  | Algorithm and Data Structures                | KZ   | 3 |
| Students will be familiarized with selected basic and derived data structures, algorithms, their properties and their design procedure. Students will analyze problems, propose theoretical solutions to the set task and the resulting algorithm write by means of flowcharts, practice in reading algorithms recorded by means of the flowchart and use the basics of Boolean algebra with forming the conditions for the algorithms.                          |  |      |   |
| 14DATS   | Database Systems                             | KZ   | 2 |
| Basic concepts of database systems, conceptual model, relational data model, the principles of normal forms, relational database design, security and integrity of data, database queries, relational algebra, SQL language, client / server, multilayer architectures, distributed database systems. Access to data via the WWW.  |  |      |   |
| 14KSP  | Constructing with Computer Aid               | KZ   | 2 |
| "CAD systems" term determination. CAD role in projecting system model. Existing CAD systems on Czech market. Project creation, basic common work rules in graphic applications and CA systems. Co-ordinated systems, CAD environment skill (basics of constructing, dimensioning, modifications, user interfaces, projecting possibilities, AutoCAD environment profiles, drawings with raster foundations).   |  |      |   |

|  |   |    |   |
|--|---|----|---|
| 14PRG  | Programming   | KZ | 2 |
| Algorithm development, methods of structured programming, high-level programming languages, basics of C programming languages (types, variables, conditions, cycles, arrays, functions), programming techniques, complexity.   |   |    |   |
| 14X31  | Project 1   | Z  | 2 |
| 14X32  | Project 2   | Z  | 2 |
| 14X33  | Project 3   | Z  | 2 |
| 14Y1AV   | Animation and Visualization                                   | KZ | 2 |
| Advanced modifications and modeling of NURBS, Patch objects, selection of objects (according to filter and properties). 3D Studio MAX systems and Space Warp objects. Atmospheric and other effects, rendering filters, Motion blur, advanced animations, Motion panel. Modeling for morphing and animation, bone formation, animation using Inverse Kinematics.   |   |    |   |
| 14Y1BE   | Barrierless Transport   | KZ | 2 |
| The issue of barrierless accessible public transportation in terms of architectural barriers and also for transportation-technological point of view. Students will gain theoretical knowledge of barrierless environment roads, railway stations, public transport stops, terminal buildings, vehicles, public transport, information and orientation systems and transportation technology. Theoretical knowledge will be supplemented by practical examples.    |   |    |   |
| 14Y1BM   | Biometric Methods   | KZ | 2 |
| Basic biometric terms, authentication methods, principles and performance measurement of biometric systems, overview of biometric technologies, hand geometry, iris recognition, retina recognition method, 2D and 3D face recognition, vein patterns on the wrist, ear biometrics, fingerprint recognition, skin spectroscopy, behavioral methods, the use of biometrics in transport applications, safety and risks of biometric technologies.                   |   |    |   |
| 14Y1HW   | Computer Hardware   | KZ | 2 |
| Computer architecture, basics of logical circuits design and their realization using FPGA. In detail, description of computer architecture and separate parts designing - controllers, arithmetic and logical units, I/O subsystem.  |   |    |   |
| 14Y1MP   | Modeling Complex Assemblies and Models in Parametric Modeller | KZ | 2 |
| Assemblies programming - tools and methodology of working subassemblies and assemblies, sheet metal parts modelling, welded assemblies, pipelines, and distribution lines. Photorealistic output rendering - physical and material properties, lighting sources. MKP - visual example.   |   |    |   |
| 14Y1OJ   | Object - oriented programming in JAVA                         | KZ | 2 |
| Objective thinking. Encapsulation. Classes. Attributes. Access modifiers. Methods and overloading. Special methods (constructors, getters / setters ...). Basic object methods. Reference data types. Inheritance. Polymorphism. Statics, constants, interfaces, abstract classes, enum, packages, exceptions, collections, generics, lambda expressions, anonymous functions.   |   |    |   |
| 14Y1OP   | Operating System  | KZ | 2 |
| Distributions. Installation GNU/Linux OS. X-window system. Rights management - users and groups, ACL rights. Filesystems and attributes. Programs and processes. OS boot, runlevels. Basic console programs / commands. Config files. SW management, package systems. Programs in graphic shell - text, spreadsheet, graphic editors, sound, video and communication. Services management. Safe and secure configuration of OS. Remote administration.             |   |    |   |
| 14Y1P2   | Computer Aid of Transportation Projecting 2                   | KZ | 2 |
| Overview of CAx application for transportation projecting aid. AutoCAD environment possibilities of basic tasks automatizing (programming, scripting, data exchange). Advanced blocks modification (attributes, relation to databases). Work in projecting group, external references. Basic tasks for communication projecting (clotoidic transition curve, cross-and longitudinal section). Basics of 3D modelling.  |   |    |   |
| 14Y1PA   | 3D Modeling in AutoCAD  | KZ | 2 |
| Work in 3D non-parametric modeller (AutoCAD) environment, scenes rendering, creation of planar and volumetric objects, user setup creation, object data creation, work with data connected with external database. Basic definition of work with lights, materials and reflexes. Models presentation.  |   |    |   |
| 14Y1PG   | Computer Graphics   | KZ | 2 |
| Basic formats of graphic and possibilities of their editing and mutual conversion. Use of individual types according to character of work. Work with editing programs (within the user level scope) using layers, DPI, colors. Basics of digital photography, scanning and computer technology like monitors and graphics cards.   |   |    |   |
| 14Y1PI   | Corporate Information System                                  | KZ | 2 |
| Data-information-knowledge, components of information system, syntactic and semantic sense of data, structure of corporate information system, particular information system (personalistic, production, storage, etc.), corporate information politic and information control, risks of information system operation, legal environment of information system operation, state information system, information system security, data protection, safety politics. |   |    |   |
| 14Y1PJ   | C Programming Language  | KZ | 2 |
| C programming language. Preprocessor, basics of the C language (data types, syntax, commands), functions, pointers, dynamical memory allocation, string, files, structures and unions. Implementations of abstract data types (FIFO, LIFO, list), programming techniques (sorting, searching, recursion), using bitwise operators.   |   |    |   |
| 14Y1PZ   | Advanced Data Processing in Spreadsheets                      | KZ | 2 |
| Students will be familiar with principles of working in a spreadsheet. Graphic layout of the table appearance, formatting of numbers, insertion of formulas and functions, including addressing, error detection. Working with large spreadsheets, filters, advanced filters, database functions. Pivot tables and charts, conditional formatting, solution finding, solver, macros, data analysis. Examples and questions from various companies and training.    |   |    |   |
| 14Y1TI   | Creating Interactive Internet Applications                    | KZ | 2 |
| Possibilities of scripting language PHP. Overview of PHP language syntax, and functions. Analysis of finished scripts and demonstration of solutions. Your own application programmed in PHP language.   |   |    |   |
| 14Y1UP   | Editing of Theses in MS Word                                  | KZ | 2 |
| Students will be introduced to the principles of creating and editing large documents and basic typographic rules. They will properly apply styles, create tables of contents, lists of figures, tables, graphs, etc. Footnotes, captions, index. They practice corrections of finished documents. The goal is to prepare students for seamless editing dissertations and theses, so that they are able to concentrate mainly on writing a thesis.                 |   |    |   |
| 14Y1VM   | Development of Applications for Mobile Devices                | KZ | 2 |
| Object oriented programming, Java programming language, development environment, operating system Android, development application - widgets, containers, threads, menu, permissions, services, GUI.   |   |    |   |
| 14Y1W1   | Webdesign 1   | KZ | 2 |
| Students will learn the basics of communication HTTP, URL and addressing, markup languages HTML and XHTML, HTML tags, rules of web accessibility and usability, CSS properties and selectors, the issue of web browsers, creating one to three column layout pages, sites validation, conditional comments. Topics will be practiced on practical examples.  |   |    |   |
| 14Y1W2   | Webdesign 2   | KZ | 2 |
| Students will learn advanced techniques CSS, responsive webdesign, CSS frontends, content management systems, JavaScript, jQuery, SEO, web server installation + configuration directives. Topics will be practiced on practical examples.   |   |    |   |
| 14Y1WG   | Webdesign   | KZ | 2 |
| Students will learn the basics of HTTP communication, URL and addressing, HTML5 markup language, advanced CSS3 techniques, accessible and usable web rules, responsive webdesign, content management systems, web server installation + configuration directives. The subject matter will be trained on examples.  |   |    |   |

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| 14Y1ZJ  | Fundamentals of programming in JAVA                 | KZ   | 2 |
| Introduction to the Java SE Platform. IDE Installation and First Project. Comments. Variables and Type System. Operators. User Input and Parsing. Chain and Chain Conversion. Text Chain and Mathematical Methods. Terms. Relational Operators and Switches. Cycles for, while, foreach. Field - declaration, initialization, methods for field work. ASCII. Functions, parameters, return value, recursion. Program creation.                                    |   |      |   |
| 14Y1ZM  | Fundamentals of parametric and adaptive modeling    | KZ   | 2 |
| Basics of work at products and parts creation. Sketch drawing by help of geometric relations, parametric dimensions, creation of adaptive models from 2D sketches. Import and export from and to another systems. Fundamentals of assemblies creation.  |   |      |   |
| 15DPLG  | Transportation Psychology                           | Z    | 2 |
| Subject of psychology and its basic concepts. Information intake, decision-making and behaviour. Performance. Engineering psychology and vehicle construction. Psychological aspects of travel route and traffic conditions, accidents and traffic incidents. Selection and training of the staff. Work and leisure. Age as a factor in transport operation.  |   |      |   |
| 15JZ1A  | Foreign Language - English 1                        | Z    | 3 |
| Grammatical structures and style. Selection of conversation topics relating to transportation sciences. Extending vocabulary, developing perceptive and communicative skills. Elementary stylistics forms. Oral and written presentation of original research. Academic text principles and reading comprehension. Principles of rhetoric.  |   |      |   |
| 15JZ2A  | Foreign Language - English 2                        | Z,ZK | 3 |
| Grammatical structures and style. Selection of conversation topics relating to transportation sciences. Extending vocabulary, developing perceptive and communicative skills. Elementary stylistics forms. Oral and written presentation of original research. Academic text principles and reading comprehension. Principles of rhetoric.  |   |      |   |
| 15JZ3F  | Foreign Language - French 3                         | Z    | 3 |
| Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.                                      |   |      |   |
| 15JZ3I  | Foreign Language - Italian 3                        | Z    | 3 |
| Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.                                      |   |      |   |
| 15JZ3N  | Foreign Language - German 3                         | Z    | 3 |
| Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.                                      |   |      |   |
| 15JZ3R  | Foreign Language - Russian 3                        | Z    | 3 |
| Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.                                      |   |      |   |
| 15JZ3S  | Foreign Language - Spanish 3                        | Z    | 3 |
| Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.                                      |   |      |   |
| 15JZ4F  | Foreign Language - French 4                         | Z,ZK | 3 |
| Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.                                      |   |      |   |
| 15JZ4I  | Foreign Language - Italian 4                        | Z,ZK | 3 |
| Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.                                      |   |      |   |
| 15JZ4N  | Foreign Language - German 4                         | Z,ZK | 3 |
| Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.                                      |   |      |   |
| 15JZ4R  | Foreign Language - Russian 4                        | Z,ZK | 3 |
| Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.                                      |   |      |   |
| 15JZ4S  | Foreign Language - Spanish 4                        | Z,ZK | 3 |
| Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.                                      |   |      |   |
| 15X31   | Project 1   | Z    | 2 |
| 15X32   | Project 2   | Z    | 2 |
| 15X33   | Project 3   | Z    | 2 |
| 15Y1BO  | Work Safety and Health Protection in Transportation | KZ   | 2 |
| Fundamental legislative, definition of terms, risks and possible health damage, working conditions and health protection with focus on transportation. Health protection programmes, health insurance of home and foreign business trips, statistics, working practice.   |   |      |   |
| 15Y1DZ  | History of Railway                                  | KZ   | 2 |
| Horse-drawn railways, steam railways, railway network development in the 2nd half of 19th century, regional railways epoch, railways of the "First Republic", electric traction, World War II railways, railway development in the 2nd half of 20th century, high-speed railway origins, railway lines closing, important long-distance train connections, railway lines construction, railway accidents, railway junctions. Excursions and projections.          |   |      |   |
| 15Y1EH  | European Integration within Historical Context      | KZ   | 2 |
| Versailles system, formation of new states. Europe and the powers, League of Nations. European policy in the 1920s. Fascism, nazism, communism. Little Entente, its principles and goals. Europe after Hitler's getting to power, system of bilateral agreements. Decline of the LN. Rearrangement of powers during WWII. Cold war and its consequences for Europe. New quality of French-German relationship - a driving power of starting European integration. |   |      |   |

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| 15Y1FD | <b>French Area Studies and Transportation</b><br>France - geography and regions, transport infrastructure. Paris and its sights, city public transport. Road traffic, motorways, railway traffic, TGV, air traffic, specialised terminology. French society and culture. Current political system. System of education, studying in France. Selected authors of French literature. French gastronomy.  | KZ   | 2 |
| 15Y1HD | <b>History of City Mass Transport</b><br>History of city mass transport in the world, development of tram, bus and trolley-bus systems. History of transport networks in the world, current trends and developments of tariff and clearance systems. History of city transport in Prague and Brno. History of tram, bus and trolley-bus operation systems in the Czech Republic and Slovakia.  | KZ   | 2 |
| 15Y1HE | <b>Work Hygiene and Ergonomics in Traffic</b><br>Basic knowledge of occupational hygiene and ergonomics, and their application in transport. Working environment factors, and the influence of these factors on health of workers. Creation and protection of working conditions that do not damage public health. Mutual links: man-machine-environment. Adaptation of technology to possibilities and skills of a man. Practical examples from the field of transportation; relevant legislature.              | KZ   | 2 |
| 15Y1HL | <b>History of Civil Aviation</b><br>Beginnings of flying, development of aircrafts lighter than air. Beginnings of aircrafts heavier than air. Czechoslovak aviation pioneers. Development of airports in the Czech Republic. World airports. Famous aviators. Helicopters. CSA airplanes. Development of aircrafts in Czechoslovakia between the years 1945-1989. Classic era of aviation. Golden era of civil aviation. Modern era of civil aviation. Airline companies. Supersonic flying.                    | KZ   | 2 |
| 15Y1MK | <b>Modern History in Context: Every Day Life and Transport</b><br>Historical overview of modern history of every day life, science, technology and transport in a wider context.   | KZ   | 2 |
| 15Y1NE | <b>German in the Economy and Society</b><br>Recent economic and social issues of German speaking countries and of the EU. Reading and listening of texts. Lexical, grammatical and semantic analysis of texts. Discussion on selected topics.  | KZ   | 2 |
| 15Y1ZV | <b>East-West dichotomy: Prelude to the Cold War</b><br>Historical prologue, evolution of the "West" and "East" from the 1500s. Focus on the history in the period between 1850 nad 1950. Milestones and continuity of the international relations in the end of 19th century and the beginning of the 20th century. Revolutions, the causes and consequences. Scientific and technological progress, the causes and consequences. Economic and financial history. Social changes. Discussions on texts, sources. | KZ   | 2 |
| 16UDOP | <b>Introduction into Vehicles</b><br>Vehicles and transportation systems. Functionality and setup. Movement and drive principles. Engines and their characteristics. Rail, road, air and water transport. Alternative means of transport. Lifting equipment and conveyors. Legislation.  | Z    | 2 |
| 16X31  | Project 1  | Z    | 2 |
| 16X32  | Project 2  | Z    | 2 |
| 16X33  | Project 3  | Z    | 2 |
| 16Y1EN | <b>Energy Requirements of Vehicles</b><br>Dynamics and the driving inertial of the vehicles. Types of energy - kinetic, static, heat, chemical and others. Ways of energy change into kinetic energy. Combustion engine, electric drive, steam engine, air engine. Energy accumulation means, accumulator, flywheel, fuel cell. Energy recuperation. WTW analysis.   | KZ   | 2 |
| 16Y1IS | <b>Interactive simulators and simulations</b><br>Simulation theory and application of computing equipment. Creating computing models. Mechanical and dynamic systems and their mathematical models. Computing methods. Simulation of vehicle dynamics, on-land carriage in particular. Virtual reality systems. Practical exercise with simulation software and interactive simulators.  | KZ   | 2 |
| 16Y1KS | <b>Quality and Reliability of Vehicles</b><br>Quality and reliability theory in design, development, production and operation of vehicles. Definition and possible approach to quality and reliability. Key legislation. FMEA (Failure Mode and Effects Analysis), QFD (Quality Function Deployment), DFx (Design for Assamly, Manufacturing, Quality, Services ...) and other methods used in industrial applications. Knowledge-based systems of quality and reliability, data collection.                     | KZ   | 2 |
| 16Y1PV | <b>Operation, Construction and Maintenance of Vehicles</b><br>Methods of vehicle production. Vehicle maintenance. Vehicle diagnostics. Maintenance and repair plans. Engine maintenance and emission measurement. Transmission mechanism. General principles of engine diagnostics.  | KZ   | 2 |
| 16Y1RE | <b>Control and Electronic Vehicle Systems</b><br>Elementary concepts of regulation. Tools for analytical solution, linear system description. Basic types of a regulator (PID), properties, advantages, disadvantages, function. Conventional and hybrid drive control. Electric drive. Vehicle communication bus (CAN, LIN, FlexRay, ISObus, KWP2000 protocole etc.). Vehicle electronic control, safety, communication and comfort systems.  | KZ   | 2 |
| 16Y1VT | <b>Development in Railroad Vehicles</b><br>Railroad vehicles traction. Railroad vehicle parametres regulation. Control and driving of railroad vehicles. Importance in heavy duty and personal transportation. Critical situation assesment. New materials in design. International standardization.   | KZ   | 2 |
| 16Y1ZG | <b>Introduction into Applied Computer Graphics</b><br>Computer graphics, division and applications with emphasis on transport, including development and research. Colours, colour perception, colour schemes, models, principles of 2D and 3D generation, elementary algorithms for graphic data workout. Visualisation principles and tasks, technics, graphics and visualisation HW basics. Introduction to 2D and 3D graphics software.  | KZ   | 2 |
| 16Y1ZL | <b>Vehicle Testing, Legislation and Construction</b><br>Vehicle, bus and motorbike costruction, aggregate computing, driving resistance, build and parameters of traction, constructional arrangement of personal cars, trucks, buses, motorbikes, legislation in the EU and in the world, technical legislation creation, testing methods, vehicle tests, accelerated tests, mathematical modelling in testing.   | KZ   | 2 |
| 17TEDL | <b>Transport Technology and Logistics</b><br>Basic terms in transport technology and logistics, particular steps of transport planning, line planning, timetabling, planning in pasanger and freight transport, organisation of traffic in each transport modus, technologic factors of the side of operator and client, organisation of city transport, logistic technologies and their application using various transport modus.  | KZ   | 3 |
| 17TGA  | <b>Graph Theory and its Applications in Transport</b><br>Basic terms of graph theory, paths in graphs, flows in networks, location problems, design problems on graphs, optimum routing, use of graphs in other scientific disciplines.  | Z,ZK | 4 |
| 17X31  | Project 1  | Z    | 2 |
| 17X32  | Project 2  | Z    | 2 |
| 17X33  | Project 3  | Z    | 2 |
| 17Y1EV | <b>Public Sector Economy</b><br>Economic and financial theory of public sector, public choice theory, externalites, decisions about public finance allocation, economic assesment of public projects (CBA, MCA, CEA), tax system of the CR, state budget, management of public projects a their economic efficiency assessment, way of elaboration of PPP projects, funding from EU funds, program HDM-4.  | KZ   | 2 |
| 17Y1LL | <b>Logistics of Passenger and Freight Air Transport</b><br>Logistics airline passenger and cargo. Aircraft and airport terminals for passenger and cargo transport. Airlines in terms of logistics systems. Aerial transport process passengers and air cargo. Information systems in air transport. Global distribution systems.  | KZ   | 2 |

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| 17Y1MD  | Marketing in Transportation                   | KZ   | 2 |
| General principles of marketing applied to transport issues, marketing tools suitable for transport as a service, specifics of public passenger transport and the resulting differences in the application of marketing.  |   |      |   |
| 17Y1OF  | Personal Finance                              | KZ   | 2 |
| Personal finance (budget, financing of basic living needs), debt (loans and credits, payment instruments, interest and fees, debt trap), financing of housing (rent, mortgage, savings, consumer loans, refinancing), savings and investments (investment horizon, return, risk, investment strategy), insurance (insurance types, suitability and adequacy), securing the future (retirement savings and insurance).   |   |      |   |
| 17Y1PM  | Personnel Management                          | KZ   | 2 |
| Human sources, work group, man as personality, planning, choice, evaluation and education of human sources, work adaptation, teamwork, intercultural communication.   |   |      |   |
| 17Y1SK  | Urban and Regional Rail Transport Systems     | KZ   | 2 |
| Factors affecting transport demand, modal-split, distribution of passenger flows on public regional transport lines. Optimization of line management, line networking. Creating and evaluation of the timetable. Vehicle circulation creation. Optimizing driver shifts and arranging them in turnus. Effects of barrier-free and public transport preferences. The role of marketing.  |   |      |   |
| 17Y1SL  | Sociology of Human Resources                  | KZ   | 2 |
| Human resources and their importance, work group as a special kind of social group, communication, personal management, modern management, human resources planning, culture of the organization.   |   |      |   |
| 17Y1ST  | Titan Simulation                              | KZ   | 2 |
| Titan is a management game simulating the business decisions. Lets 2-8 student groups to produce and compete in the market with the same product. Students set a price and determine the quantity and capacity of production, plan budgets for marketing, research and development. They become familiar with the consequences of their decisions by the form of financial corporate reports and they use this information for other business decisions.        |   |      |   |
| 18MTY   | Materials Science and Engineering             | Z,ZK | 3 |
| Basic course of materials science and engineering explains mechanical properties of structural materials based on their bonding forces and microstructure. However the main attention is paid to metals as the most important engineering materials, also other major classes of materials are presented, namely ceramics, polymers and composites. Attention is also paid to degradation processes in materials, to defectoscopy and to main mechanical tests. |   |      |   |
| 18PZP   | Elasticity and Strength                       | Z,ZK | 3 |
| Tension and compression. Bending of beam. Shear stress during bending of beam. Design and analysis of cross section of beam. Design of riveted, bolted and welded joint of structure. Analysis of deflection curve of beam. Torsion of circle cross section. Combined loading. Stability of compressed bar and buckling. Beam on elastic foundation. Strength analysis.   |   |      |   |
| 18SAT   | Structural Analysis                           | Z,ZK | 4 |
| General system of forces in plane and space. Calculation of reactions of bodies and structures. Assessment of internal forces on statically determinate beams and simple girders. Principle of virtual work. Kinematic method for calculation of reactions of statically determinate systems. Determination of axial forces in truss constructions. Cross-sectional characteristics of planar shapes. Fiber polygons and chains.                                |   |      |   |
| 18TED   | Technical Documentation                       | KZ   | 2 |
| Technical standards, international standardization, technical drawings, representation of technical objects, technical diagrams and charts, dimensional and geometrical accuracy, arrangement of drawing sheets.  |   |      |   |
| 18X31   | Project 1                                     | Z    | 2 |
| 18X32   | Project 2                                     | Z    | 2 |
| 18X33   | Project 3                                     | Z    | 2 |
| 18Y1AM  | Anatomy, Mobility and Safety of Man           | KZ   | 2 |
| Survey of tissues. Anatomical structure and growth of bones. Articular joint. Remodelling of bone tissue. Anatomical structure of muscles. Blood circulation and nervous system. Structure and biomechanics of muscular-skeletal system. Injury of human organs and musculo-skeletal system during traffic accidents. Mobility of ill and injured man and his treatment. Human joint prostheses. Protective means and traffic safety regulations.               |   |      |   |
| 18Y1EM  | Experimental Methods in Mechanics             | KZ   | 2 |
| The purpose and role of experimental mechanics. Sensors for mechanical testing. Overview of experimental methods. Destructive and non-destructive testing of materials. Design of experimental procedures and sample preparation. Tensile and bending tests. Electrical resistance strain gages. Optical based strain measurement. Fatigue and lifetime prediction. Instrumented hardness testing. Introduction to electron microscopy. Errors in measurement.  |   |      |   |
| 18Y1MT  | Engineering Materials                         | KZ   | 2 |
| Systematic overview of main classes of materials used in technical design. In addition to main classes of materials, i. e. metals, ceramics, polymers and composites, attention is paid to biological materials and to biomimetics. Integral approach to material selection process is also demonstrated based on so called Ashby's selection charts.   |   |      |   |
| 18Y1PS  | Computer Simulations in Mechanics             | KZ   | 2 |
| Principles and overview of tools for stress analysis of structures. Numerical methods in mechanics, finite element method. Geometric model development and adaptation of geometry from other CAE systems. Assignment of material properties. The types of elements and their use. Discretization of solid model. Boundary conditions and application of the load. Basic tasks of structural and modal analysis. Introduction to complex nonlinear problems.     |   |      |   |
| 18Y1UK  | Introduction of Rail Vehicles                 | KZ   | 2 |
| Basic characteristics and parameters rail transport systems - railway and urban transport. Basis driving mechanics rail vehicles - equation of motion train and unit trains. Rolling and track resistance. Total running resistance. Acceleration force. Analyzing driving cycle rail vehicle. Speed-power diagrams and characteristics rail vehicle - hydromechanic, hydrodynamic and electric drive. Design concept rail vehicles and drive of wheel set.     |   |      |   |
| 20SYSA  | Systems Analysis                              | Z,ZK | 5 |
| Introduction to system sciences, system viewpoint, terminology, typical system analysis tasks, system identification, system interface and interface tasks, processes, system behaviour and its analysis, strong functions and processes, genetic code, system identity, system architecture. Tools for system analysis - Petri nets, decision tables, algorithms for structural tasks. Soft and hard systems, methods for soft system analysis.                |   |      |   |
| 20UITS  | Introduction to Intelligent Transport Systems | Z,ZK | 7 |
| Terminology and legislative framework telematics systems and their architecture. Telematics systems in practice and their operation. Fundamentals of information and telecommunication systems for ITS. Principles and technical support measurement of traffic data, localization and navigation. Practical work with traffic data. Real examples of possible applications of the principles of ITS.   |   |      |   |
| 20X31   | Project 1                                     | Z    | 2 |
| 20X32   | Project 2                                     | Z    | 2 |
| 20X33   | Project 3                                     | Z    | 2 |
| 20Y1AE  | Applied Electronics                           | KZ   | 2 |
| Basic electronic semiconductor components, their principles, characteristics and typical connection diagrams. Semiconductor PN junction diodes, transistors, thyristor, operational amplifiers, basic logic gates. Functions of basic electronic circuits and methods for their designs (rectifiers, voltage regulator with Zener diode, transistor as an amplifier, operational amplifier as an inverting and noninverting amplifier).                         |   |      |   |

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| 20Y1AF  | Alternative Forms of Transportation Project Financing | KZ   | 2 |
| In will be specified such forms of financing in transportation and telecommunications, where the public sector body perform the final debtor, i. e. debt payments come from its budget but the final debtor is not a direct participant of the transaction and it is not the counterparty of the financial institute which provides the funding. Issue of securities as an alternative source of transportation and telecommunication projects.               |   |      |   |
| 20Y1EA  | Environmental Aspects of Transport                    | KZ   | 2 |
| State of the atmosphere, weather observation network, weather in transportation, road meteorology. Weather forecasting, data assimilation, probabilistic forecasts, forecast evaluation. Air quality, main pollutants and their effects, atmospheric chemistry, traffic emissions. Greenhouse gasses, carbon cycle, a role of energy and transportation in climate change.  |   |      |   |
| 20Y1EK  | Qualification in Electrical Engineering               | KZ   | 2 |
| Practical experience with measurements in laboratories, electrical equipment, power supply, electrical installation of low voltage, electric shock hazard, symbols and labeling, nominal voltage, maximum allowed currents, electrical equipment protection against short circuit and overload protection, control and revision, first aid, legislation, standards and regulations in relation to health and safety and electrical engineering.               |   |      |   |
| 20Y1KP  | Communication and presentation skills                 | KZ   | 2 |
| Motivation, priorities and their fulfillment, current communication networks, work with various sources, formal requirements of emails and final theses, basic typology of personalities, teamwork, emotional intelligence, manipulation and way of working with it, coping with stressful situations, formal requirements of presentations, ways of communication during presentation, presentation skills, presentation skills in online environment.       |   |      |   |
| 20Y1LN  | Location and Navigation                               | KZ   | 2 |
| Description and examples of road networks, localization on the network. Routing algorithms, their properties and implementation. Description and examples of datasets for finding transport connections, routing algorithms, their properties and implementation.   |   |      |   |
| 20Y1OI  | Fare Collection and Information Systems               | KZ   | 2 |
| Fare collection systems in public transport and their components (on-board units, validators, turnstiles, ...). Information systems and their components for users (timetables, maps, panels ...) and operators (cycles, location or current delay of vehicles, ...). The issue of tariff systems. Other examples of clearance systems (parking).   |   |      |   |
| 20Y1OK  | Road Lighting   | KZ   | 2 |
| Basic lighting quantities and terms, street lighting components (luminaires, control cabinets for street lighting, street lighting cables), characteristics of luminaires (lifetime of light sources, light distribution), standards, measurement of illuminance and luminance in road lighting, tunnels, conceptual approach to street lighting design, lighting calculations in DIALux and Relux, street lighting control systems.                          |   |      |   |
| 20Y1PK  | Product Quality Management Processes                  | KZ   | 2 |
| General principles of organization management. Management systems and international standards; quality management systems. Quality products, processes, systems. A framework of standards for systems management, management principles. Principles of process management, monitoring and measurement systems management. Uniform framework of standards for systems management. Process management principles. Metrology and testing. Product certification. |   |      |   |
| 20Y1SC  | Sensors and Actuators                                 | KZ   | 2 |
| Principles of sensors and actuators. Basics of measuring theory and actuating influence. The respective technologies and construction principles. Sensors of mechanical, electro-magnetic, state (temperature, humidity), chemical and particle flow values. Electrical, pneumatic and hydraulic actuators and solid phase elements.  |   |      |   |
| 21ELED  | Air Transport Economy                                 | Z,ZK | 4 |
| The economics of air transport is a key subject for understanding market relations in air transport. The introduction is devoted to understanding the basic economic principles. This is followed by a practical section that economic linkages in the domain of airlines.  |   |      |   |
| 21LAG1  | English for Aviation 1                                | KZ   | 3 |
| Familiarity with the terminology used in civil aviation in the general context and emphasizing the ability to receive information only in English.  |   |      |   |
| 21LAG2  |   | KZ   | 3 |
| 21LCM   | Aircraft Engines                                      | Z,ZK | 3 |
| Aircraft piston engine, theoretical background, operational characteristics and construction schemes. Propellers, operational characteristics. Turbine engine, theoretical background, thermal cycles, construction schemes, operational characteristics. Turbojet and turbofan engines, basic construction modules, and their operational characteristics. Engine control.   |   |      |   |
| 21LGP   | Legislation and Operational Regulations               | Z,ZK | 5 |
| Introduction into aviation regulations. The scope of international and national organizations in civil aviation. Analysis and interpretation of the ICAO Annexes 1-19, ICAO Docs. 4444, 7030, 8168. Introduction to the European Parliament and Council Regulation (EC), Commission Regulation (EU) and the Decisions of the Executive Director of EASA.  |   |      |   |
| 21LIVO  | Human Performance and Limitations                     | Z,ZK | 5 |
| Human performance & limitations, aptibility & competence, accident statistics, flight safety, basics of flight physiology, man & environment, breathing & circulation, sensory system, health & hygiene, health preservation, intoxication, incapacitation, basics of flight psychology, human information processing, memory & learning, theory & model of human error, body rhythms & sleep, stress, fatigue, working methods.                              |   |      |   |
| 21LL1   | Aircraft 1  | KZ   | 3 |
| Aircraft structural and conceptual design types - definitions and basic knowledge of the problem. Development of requirements, aircraft definitions and categorisation. Aircraft loadings. Systems of primary and secondary airframe structure. Airframe and propulsion unit. Lectures are devoted to aeroplane topics.   |   |      |   |
| 21LTA2  | Aircraft 2  | Z,ZK | 2 |
| Manufacturers responsibility, responsibilities of operator and professional supervising. Legislation in area of airworthiness. International and national standards. Static solidity of aircraft structures. Aeroelasticity. Inherent and operational reliability of aircraft structure. Fatigue strength. Aircraft structure lifetime presumption.   |   |      |   |
| 21LTN   | Air Navigation  | Z,ZK | 2 |
| Earth - its shape, parameters and properties. Aeronautical charts and their use. Measuring time. Dead reckoning. Radionavigation aids. Global navigation satellite systems. Air traffic services routes and their design.   |   |      |   |
| 21LTTE  | Aerodromes  | Z,ZK | 4 |
| Aerodrome reference point and temperature, TORA, TODA, ASDA, LDA. Taxiway and apron. Clearway. Stopway. Obstacle limitation surfaces. Runway marking. Runway zone lights. Environmental conditions. Public traffic.   |   |      |   |
| 21MRG   | Meteorology   | KZ   | 3 |
| Structure of atmosphere. Vertical stratification. Pressures QNH, QFE, QFF, QNE. Instability. Atmospheric fronts. Atmospheric precipitation - origin and kinds. Turbulence. Powers causing wind. Cyclone and anticyclone. Gradient and geostrophical wind. Visibilities in air transport. Dangerous meteorological phenomenas. Meteorological maps. Climatology. Circulation. Intertropical front. Meteorological informations.                                |   |      |   |
| 21OBP   |   | Z,ZK | 3 |
| Aviation business and transport operations is a core subject for understanding operational relationships in air transport. It focuses on the process and functional arrangements as well as the economic aspects and infrastructure of air transport.   |   |      |   |
| 21PAP   | Flight Planning and Performance                       | Z,ZK | 4 |
| Mass and balance. Load of aircraft. Determination of centre of gravity - loadsheet, trimsheet. Aircraft weighing. Overloading of aircraft. Basic characteristic speeds. Runway characteristics. Take off and landing performance. Drift down. ETOPS. MEL. Flight planning and monitoring. Routing. FL and speeds selection. Charts. ICAO ATC FPL. Aerodrom operation minimums. Fuel plan. Operational flight plan.  |   |      |   |

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| 21PDLE | <b>Airport Design and Operation</b><br>Methods for the new airports design. Existing airports development. A closer look at the development of the airports operational areas. Certification of the operating areas and procedures by ICAO Airports Manual. Development planning and project preparation, regulatory basis.   | KZ   | 3 |
| 21PJE  | <b>Aircraft Instruments</b><br>Overview of aircraft instrumentation and its principles and construction, aircraft electrical systems, engine measuring and monitoring systems, air data computer, icing monitoring systems, gyroscopic indicators, inertial and radio navigation means, communication means, data recorders, complex flight and navigation data processing systems.   | KZ   | 2 |
| 21RILP | <b>Air Traffic Control</b><br>Air traffic services and their distribution. Organization of air traffic, flow and capacity management. Airspace management. System support for aircraft flying through space. Flight plan, the form, content. Separation of aircraft. Reports of air traffic services, the form, content. Harmonization and integration of ATC. CFMU and its subsystems. Flexible use of airspace - FUA. RVSM, RNP. New trends in the area of ATC.   | Z    | 2 |
| 21ULCT | <b>Aircraft Maintenance</b><br>Aircraft operations and technical operations. Maintenance and work processes. Defects search methods, status check diagnostic tools. Selection and qualification of aviation personnel. Basic documentation for maintenance. Optimization of time maintenance intervals. Regulation no. 1321/2014 Part 145. Human factors of aircraft maintenance. Regulation of director EASA for aircraft maintenance. Seminars will be focused on practical application.                              | Z    | 2 |
| 21X31  | Project 1   | Z    | 2 |
| 21X32  | Project 2   | Z    | 2 |
| 21X33  | Project 3   | Z    | 2 |
| 21Y1AM | <b>Aeronautical Information Management (AIM)</b><br>Definition and basic overview of AIS and AIM. Transition from AIS to AIM. Regulatory base. Provision of AIS/AIM in the Czech Rep. AIP (Aeronautical Inf. Publication). VFR Manual of the Czech Rep. AIRAC System. NOTAM messages. PIB (Pre-flight Information Bulletin). AIC (Aeronautical Inf. Circulars). Aeronautical Charts. EAD (European AIS Database). QMS (Quality Mng. System). ADQ (Aeronautical Data Quality). AIXM (Aeronautical Inf. Exchange Format). | KZ   | 2 |
| 21Y1BC | <b>Aviation safety and security</b><br>History of safety and security development in aviation. Modern tools for safety and security management. Research and development of safe and secure systems.  | KZ   | 2 |
| 21Y1BS | <b>Unmanned aircraft systems 1</b><br>Unmanned Aviation Development. Aircraft design. Legislation in force in the Czech Republic. Planning and execution of the flight. Airspace division. Operational risks and operational procedures. Practical flights.   | KZ   | 2 |
| 21Y1FN | <b>Factors Affecting the Rate of Accidents in Aviation</b><br>Introduction. The scope of international and national organizations in civil aviation. The scope of the investigation organisations within the state and international committees. Analysis and interpretation of ICAO Annexes 13 and 19. Analysis and interpretation of the Regulation (EC), Regulation (EU). Human factor. Utilization of information from the investigation reports.   | KZ   | 2 |
| 21Y1MP | <b>Matlab for project-oriented study</b><br>The subject's syllabus is focused on the problem-solving during bachelor's thesis preparation and it is based on students' requests. Individual exercises will be prepared according to particular examples, based on actual students' needs and suggestions. The subject will have a flexible form, which is expected to bring an improvement of students' Matlab skills.  | KZ   | 2 |
| 21Y1MZ | <b>Managerial Ethics</b><br>The basic terminology of managerial ethics. Basics of etiquette and rules of social contact. Social events. Etiquette of working contacts. The art of presentation and negotiation. Personal image. Diplomatic protocol. Managerial ethics. Business ethics.  | KZ   | 2 |
| 21Y1PA | <b>Air Traffic Control Operating Procedures</b><br>Practical exercises on the ATC simulator with the following focus - getting familiar with the simulation environment, acquiring basic habits, aircraft identification procedures, vectoring, level changes, ATC clearance, use of RNAV points. Practical exercises focused on the basis of vectoring, timely application of vertical spacing, EST and REV message transmission. Exercises in the APPROACH airspace, arrivals, departures and conflict solutions.     | KZ   | 2 |
| 21Y1RZ | <b>Human Resources Management</b><br>The position of human resources in the organization and related disciplines file. Substance, importance and challenges of human resources management. Internal and external environment of human resource management. Human resource planning. Search, recruitment and selection of employees. Motivation, evaluation and remuneration of staff. Positioning, dismissal and redundancies of employees. Education of employees. Planning career management.                         | KZ   | 2 |
| 21Y1TH | <b>Aircraft Technical Handling</b><br>Aircraft towing and pushing tractors. GPU. Air conditioning and heating units. Aircraft fuel equipment. De-icing and anti-icing units. Loading and unloading units. Equipment for passengers onboarding and offboarding. Operational processes of aircraft technical handling and regulations. Modernization and technical progress.  | KZ   | 2 |
| 21ZALD | <b>Basics of Air Transport</b><br>History, definitions, terminology, basic rules. VFR/IFR. Basics of aerodynamics. Propulsion of aircraft. Aircraft design. Basics of navigation, radio navigation. Weight, balance, performance. Flight planning, optimization of speed and heights, minimum fuel. Limitations of operation, maintenance, service life of aircraft. Traffic management, ground handling, security. Air crew. Airlines and economics. Space technologies.   | KZ   | 2 |
| 21ZT   | <b>ATM Systems</b><br>The course introduces classical and modern facilities, systems and technologies designated for ATS. Student obtains knowledge of technical principles and solutions as far as communication, navigation and surveillance aviation systems are concerned.  | ZK   | 2 |
| 21ZYL1 | <b>Principles of Flight 1</b><br>Aerodynamic drag, relation between drag and speed, streamline, boundary layer, formula of continuity, formula of Bernoulli, lift and drag, air flow and pressures around wing, angle of attack, reactions of wing in air flow, lift and drag of a wing and an aircraft, coefficient of lift and drag, critical angle of attack, wing with final span, induced drag, interference, devices for lift and drag increase.  | Z,ZK | 5 |
| 21ZYL2 | <b>Principles of Flight 2</b><br>Ways of producing thrust, propeller, jet propulsion, thrust and momentum, propulsion efficiency, aerodynamics of fixed and variable pitch propeller, propeller operation modes, propeller airstream effect, gyroscopic effect, balance of forces in horizontal flight, glide and landing, performances, take off a climb, acceleration, positive load, manoeuvres, stability and controllability, transsonic speeds.   | Z,ZK | 5 |
| 22X31  | Project 1   | Z    | 2 |
| 22X32  | Project 2   | Z    | 2 |
| 22X33  | Project 3   | Z    | 2 |
| 23X31  | Project 1   | Z    | 2 |
| 23X32  | Project 2   | Z    | 2 |
| 23X33  | Project 3   | Z    | 2 |

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| 23Y1DZ  | Data and Their Processing for Engineering Fields Needs | KZ | 2 |
| Courses of risk, basic terms, data collection, data sets, data random uncertainty and data epistemic uncertainty, data processing, hazard, risk, value scales, analytical, empirical and heuristic methods, hazard determination and risk determination, methods for variants' creation, decision support systems.  |  |    |   |
| 23Y1KM  | Crisis Management                                      | KZ | 2 |
| Theory and legal frame of crisis management with direction to Rescue system (Izs). After introduction to safety domain, there are terms and knowledge on: theory and position of crisis management and its targets; Izs-crisis management-crisis planning; and basic legislation. Practical part is concentrated to responsibility matrix compilation.  |  |    |   |
| 23Y1KO  | Quantum Physics and Optoelectronics                    | KZ | 2 |
| Ground of quantum physics. Application of quantum physics in practice. Optoelectronics. Production of optoelectronics components.   |  |    |   |
| 23Y1OK  | Protection of Critical Objects and Infrastructures     | KZ | 2 |
| Types of technological systems, critical item, risks and their courses, criticality, vulnerability, connectivity, dependability, resilience, failure, protection, safety of critical objects and critical infrastructures.  |  |    |   |
| 23Y1VS  | Negotiation and Cooperation                            | KZ | 2 |
| Code of conduct for negotiation. The influence of personality traits on the negotiations. Negotiation and commanding. Teamwork. Variants teams. Informal and formal role in the team. Principles of negotiation, the essence of negotiation, the differences in negotiation in business and in crisis situations, the principle of "win both", specifications and bidding, the role of trust. |  |    |   |
| TV-1  | Physical Education                                     | Z  | 1 |
| TV-2  | Physical Education                                     | Z  | 1 |

For updated information see <http://bilakniha.cvut.cz/en/FF.html>

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